

2016

Processes involving forms of parental control and child internalizing and externalizing behavior

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**Processes involving forms of parental control and child internalizing and externalizing
behavior**

by

Dong Zhang

A dissertation submitted to the graduate faculty
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

Major: Human Development and Family Studies

Program of Study Committee:
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Iowa State University

Ames, Iowa

2016

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DEDICATION

I dedicate this dissertation to my wife Cheng, whose support help me during the whole process of this work, and to my son Ethan, who is the source of my motivation.

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ACKNOWLEDGEMENTS

I would first like to express my sincerest appreciation to my major professor Dr. Clinton Gudmunson who has provided invaluable guidance and instruction throughout all stages of my doctoral training. I would also like to thank him for the freedom and opportunities to develop my research interests and necessary skills. I look forward to our continuing relationship both professionally and personally.

I would also like to thank my doctoral POS committee members, Dr. Daniel Russell, Dr. Cynthia Fletcher, Dr. Mack Shelley and Dr. Cindy Yu, for their insightful suggestions during the early stages of this dissertation, which helped not only the two current studies but also my future research direction. In addition, I want to extend my great appreciation to the opportunity to analyze the data from the Flourishing Families Project (FFP). Without the foresight of the principal investigators, Dr. Randal Day and Dr. Laura Walker, the current studies would not have been possible.

Lastly, I would like to thank my research supervisors, Dr. Carla Peterson and Dr. Janet Melby, my colleagues, my friends, and all other people who have provided me various types of support during my doctoral study. Words cannot express my love and appreciation for the support and dedication of my wife, Cheng, my father, Mingguo and the little one, Ethan.

ABSTRACT

The current study used structural equation modeling to explore the effect of family financial hardship on parental control behaviors, which in turn affect child developmental outcomes. The research focused on two major questions: how family economic stress affects parental control behavior, and why psychological control and behavioral control have different impacts on child outcomes?

Using the data from the Flourishing Families Project, the current study provided findings on the potential antecedents of parental control behaviors with the guidance of the family stress model, where marital conflicts caused by financial hardship explained some of the psychological control behaviors that parents use, but not so much on explaining behavioral control behavior. In addition, parental control behaviors affect child internalizing and externalizing behavior differently through meeting children's autonomy, competency and relatedness needs. Specifically, significant indirect effects were shown between parental psychological control behaviors to child internalizing and externalizing behaviors through child autonomy; psychological control had a significant indirect positive effect on internalizing behaviors through child competency while behavioral control showed a significant indirect negative effect on internalizing behaviors and no indirect effect was found on externalizing behaviors; and no significant indirect effect was observed from the investigation of relatedness needs.

These findings illustrated the complex nature of parent-child interaction and relationship. Implications, including specific suggestions for practice and recommendations for future research, were also presented.

CHAPTER 1. INTRODUCTION

A variety of parenting strategies have been used by parents to socialize their children. Investigations of how parents regulate children's behaviors has been a growing topic of interest for researchers in the past several decades (e.g., Barber, Stolz, Olsen, Collins, & Burchinal, 2005; Baumrind, 1967; Schaefer, 1965; Skinner, Johnson, & Snyder, 2005). Parental control, as a regulation tool for parents, can be categorized into two aspects, parental psychological control and parental behavioral control. Parental psychological control refers to intrusive, manipulative, and dominant parenting attempts that inhibit or interfere with children's development of autonomy and independence by catering to parents' own psychological needs, and often in perverse forms. In contrast to parental psychological control, parental behavioral control involves supervision, regulation and provision of clear rules or guidelines for children's behavior.

Studies have found associations between psychological control and detrimental child outcomes, such as depression (Barber et al., 2005; Soenens, Vansteenkiste, Luyten, Duriez, & Goossens, 2005), anxiety (Pettit & Laird, 2002), low self-esteem (Soenens, Vansteenkiste, et al., 2005), eating disorders (Soenens, Elliot, et al., 2005) and delinquency (Barber, 1996). Although parents may not be aware of their use of psychological control, this type of parenting behavior lacks responsiveness to the psychological needs of children by forcing compliance through psychological tension (Barber, 1996; Grolnick, 2002; Maccoby & Martin, 1983), which can be understood through the effect of control on the children's development of psychological autonomy and child adjustment problems. Barber, Olsen, and Shagle (1994) also found that parental psychological control makes children less confident of their own worth and makes them

more likely to turn inward or withdraw in order to avoid the stresses and pressures of social interaction (Barber et al., 1994).

On the other hand, behavioral control, as another type of parenting control behavior, refers to the provision of rules, regulation or structuring of children's physical behavior. Lack of behavioral control has substantial effect on adolescents' development, as it is usually associated with problems in adolescents as a result of poor supervision, weak regulation, and lack of monitoring (Barber et al., 1994). Specifically, lacking behavioral control has been associated with behavior problems, such as aggression, delinquency, drug use, and bad school performance (e.g., Chorpita & Barlow, 1998; McLeod, Weisz, & Wood, 2007).

Most of the emotional problems and behavior problems caused by parental control behavior can be categorized into either internalizing and/or externalizing behavior (Achenbach & Edelbrock, 1978). Internalizing behaviors include symptoms such as depression, anxiety, social withdrawal, sadness, and low self-esteem, whereas externalizing behaviors include aggression, antisocial behavior, and misconduct. Studies focused on the trajectories of internalizing and externalizing behaviors suggested a relatively stable internalizing behavior across early and middle childhood, with increases during adolescence (e.g., Bongers, Koot, Van der Ende, & Verhulst, 2003). Meanwhile, a mixture of developmental courses were found for externalizing behaviors, depending on the measures used and among the variety of populations that have been sampled (e.g., Munson, McMahon, & Spieker, 2001). Research on the consequences of internalizing and externalizing behaviors has found that they were associated with a large range of problems, such as impaired academic and social development in children (Hinshaw, 1992; Mash & Barkley, 2014), early age of alcohol, nicotine, and drug use (McGue, Iacono, Legrand,

Malone, & Elkins, 2001), and poor quality of attachment to parents (Buist, Deković, Meeus, & van Aken, 2004).

Studies that have examined these two types of parental control behaviors have revealed different associations between the parental control behaviors and adolescent adjustment (Barber & Olsen, 1997). It is very easy for people to think that the control behaviors are on a single continuum, because higher behavioral control has been found consistently associated with lower levels of externalizing behaviors while psychological control, on the other hand, was linked to higher levels of externalizing behavior problems such as substance use, delinquency, and antisocial behaviors (Barber, 1996; Barber, Bean, & Erickson, 2002; Barber & Harmon, 2002; Barber & Olsen, 1997; Pettit, Laird, Dodge, Bates, & Criss, 2001). However, it is just the magnitude of control, effects of control vary between families; for example, psychological control was also found to be related to higher levels of internalizing behaviors such as depression and sadness but no association was found for behavioral control (Barber, 1996; Gray & Steinberg, 1999; Pettit & Laird, 2002). How psychological and behavioral control work on child internalizing and externalizing behaviors, and why the effects of parental control behaviors are different, need further investigation.

Given the important impacts of parental control behaviors on child developmental outcomes, it is clearly important to study their antecedents, but it was not until the last decade that researchers have started to address this issue. Research examining parental psychological control behaviors has demonstrated that parents' use of psychological control could be determined by factors such as family functioning (e.g., interparental hostility; Buehler, Benson, & Gerard, 2006), adolescents' characteristics (e.g., age, gender and problem behavior; Barber, 1996; Smetana & Daddis, 2002), and parents' characteristics (e.g., beliefs and personalities;

Smetana & Daddis, 2002; Soenens, Elliot, et al., 2005). However, little research has investigated the effects of economic hardship and family financial pressure in predicting parental control behavior.

The family stress model (FSM; R. D. Conger & Conger, 2002) has provided fundamental theoretical support for most of the research regarding the negative influence of financial hardship on families and adolescents over the past three decades (e.g., K. J. Conger, Rueter, & Conger, 2000; R. D. Conger et al., 1992; R. D. Conger, Conger, & Martin, 2010). Strong empirical support for this model has been found across a variety of different samples with different ethnicity, nationality, and family backgrounds (Brody & Flor, 1998; R. D. Conger & Conger, 2002; R. D. Conger et al., 1992, 1993; Formoso, Gonzales, Barrera, & Dumka, 2007; Gershoff, Aber, Raver, & Lennon, 2007; Mistry, Vandewater, Huston, & McLoyd, 2002; Parke et al., 2004; Solantaus, Leinonen, & Punamäki, 2004; Yeung, Linver, & Brooks-Gunn, 2002). The FSM suggests that experiences of economic hardship, including events such as unemployment and not being able to make ends meet, lead to parent psychological distress (e.g., depression, anxiety), and increases parental conflict due to pressures of financial constraints (Barnett, 2008; R. D. Conger & Donnellan, 2007; Mistry, Biesanz, Taylor, Burchinal, & Cox, 2004). The financial constraints experienced by caregivers, in turn, have explained psychological distress and parental conflict, which contribute to problems in parenting behaviors and then influences the development of children and adolescents (R. D. Conger et al., 2010).

Meanwhile, Deci and Ryan (2002) have proposed that parental control detrimentally affects children's developmental outcomes because of undermining effects on meeting children's need for autonomy, competence, and relatedness. According to self-determination theory, children's behaviors vary in the degree to which they are autonomous versus being controlled.

Autonomous behaviors were usually influenced by internal factors, which were performed volitionally and were conducted based on personal interests or from one's integrated sense of self (Deci & Ryan, 1991). On the other hand, controlling behaviors were often caused by external factors, such as pressure, demands, or order (Ryan, 1982). However, no empirical study has been done to test these hypotheses.

Two important questions to be raised include: how family economic stress affects parental control behavior, and why psychological control and behavioral control have different impacts on child outcomes. The current study focuses on answering these two main questions based on the theoretical frameworks of the family stress model and self-determination theory. To answer the first question, study one is designed to investigate whether economic hardship or family financial pressure is an antecedent of parental behavioral control and parental psychological control (Barber et al., 1994; Schaefer, 1965) using an adaptation of the FSM (R. D. Conger et al., 1992, 1993). Moreover, by replacing nurturant-involved parenting and introducing two forms of controlling parenting behavior into the family stress model, the study will try to examine how parental control behaviors influence child internalizing and externalizing behaviors, and whether there are any differences between the two forms of parental control behaviors in their effects on child outcomes. Furthermore, instead of examining one perspective of child outcome as in most studies using the family stress model, the current study will investigate both child externalizing behaviors and internalizing behaviors in one model. By doing so, the model will help us better understand the associations between family financial pressure and two perspectives of child outcome through parental behavioral control and parental psychological control. Finally, the results from study one will provide helpful insights on how the recession in 2007 impact family functioning. The Great Recession, which began in December

2007, is widely recognized as the most serious economic crisis since the Great Depression that began in 1929. The main effects of a recession often include: consequent reductions in labor demand, resulting in reduced working hours and increased unemployment; diminishing asset values; reduced capacity to manage living expenses and service debt; and increased uncertainty and fear about the future (Gray, Edwards, Hayes, & Baxter, 2009). As Gauthier and Furstenberg (2010) state, the recent recession was distinct from previous recessions in that it impacted upper, middle, and even lower socioeconomic groups. Those who were directly impacted by job loss, and those witnessing these layoffs in the surrounding community were all impacted by the Great Recession (Modreck et al., 2014). Thus, no one was untouched by the economic downturn and it is worthwhile to explore more in this context.

Study two is designed to examine the associations between parental control behaviors (psychological control and behavioral control) and child problematic outcomes (internalizing and externalizing) through the lens of self-determination theory (Barber et al., 1994; Deci & Ryan, 2002). Specifically, the proposed model will test the associations between two forms of parental control behavior and two types of children's problematic outcome. In addition, the model will investigate possible mediators between the associations based on the three basic psychological needs (autonomy, competence, and relatedness) proposed by self-determination theory. In so doing, the model will help us better understand both direct and indirect associations among the two forms of parental control behavior and the two perspectives of child problem behavior outcomes.

In sum, to examine the potential effect of financial pressure on parental control behavior and child outcomes, this study will explicitly investigate the associations among economic pressure, parental control behavior, and child outcomes using longitudinal data with a sample of

families from the Flourishing Family Project (FFP). In addition, this study will examine how parental control behaviors influence child outcomes through meeting or understanding children's needs for autonomy, competence, and relatedness based on self-determination theory. By doing so, the current work attempts to examine and help us understand what affect parents' engagement in either parental control behaviors under the framework of the family stress model. The goal is to provide better understanding of parental control behavior on child outcomes through the application of meeting children's needs based on self-determination theory. By examining the controlling aspects of parenting in the family stress model context, we should be able to see how economic pressure affects the controlling behaviors of parents. When the role of self-determination factors is better understood, researchers can implement interventions and parents can adjustment their behaviors to better fulfill the needs of the children so as to limit internalizing and externalizing behavior problems.

CHAPTER 2. POTENTIAL ANTECEDENTS OF PARENTAL CONTROL BEHAVIORS: EXPANSION OF THE FAMILY STRESS MODEL

A paper to be submitted to *Journal of Family Psychology*

Dong Zhang¹ and Clinton G. Gudmunson²

Abstract

Researchers have studied the distinctions and consequences of parental control behaviors, however, limited research has been done to examine the antecedents of parental psychological control and behavioral control. Based on the family stress model, this study examined whether family financial hardship served as an antecedent of parental control behaviors and what the mechanism is behind the associations. The sample used in the current study was from the Wave 3 and Wave 5 assessments of the Flourishing Families Project. Analyses were conducted using structural equation modeling.

Results indicated that marital conflicts influenced by family financial hardship explains some of the psychological control behaviors that parents use, but not so much on explaining behavioral control behavior. Findings confirmed that internalizing behaviors were associated with parental psychological control behavior, while externalizing behaviors were related to parental behavioral control. Findings from this study suggested that helping families with their

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financial difficulties and intervention of marital conflicts may have a positive impact on decreasing the use of parental behavioral control but not on behavioral control.

Introduction

Since the detailed definition of parental psychological control and behavioral control described by Steinberg (1990), an increasing interest in the research of parental control behavior have been witnessed in the past three decades. Recent research has further examined the constructs, demonstrated the distinction between the two constructs of parental control behavior, and explored the consequence of control behaviors on adolescent adjustment (Barber & Harmon, 2002; Barber et al., 1994; Barber et al., 2005). Parental psychological control refers to parental intrusiveness, love withdrawal, and guilt induction, where parents tried to manipulate adolescents' psychological development (e.g., autonomy and self-identification). In contrast, behavioral control is generally considered as the provision of regulation and supervision on adolescents' behavioral world (e.g., activities and friends; see Barber et al., 2005 for detailed review). Studies that examined psychological control across different nationalities found it was associated with higher levels of internalizing problems such as depression and anxiety, whereas behavioral control was often linked to improved psychosocial function such as decrease in delinquency and aggression behaviors (Barber et al., 1994; Nelson, Yang, Coyne, Olsen, & Hart, 2013; Soenens, Park, Vansteenkiste, & Mouratidis, 2012).

Despite the popularity of research on the distinction and consequences of parental control behaviors, limited research has been done to examine the antecedents of parental psychological control and behavioral control. Among the little research that was done to explore the potential antecedents of parental control behaviors, inter-parental hostility, proactive parenting, socioeconomic status, and child gender were found to be predictors of parental control (Buehler

et al., 2006; Laird, 2011; Pettit & Laird, 2002; Pettit et al., 2001). However, none of the research has specifically looked at the effect of economic hardship or financial pressure on parental control behavior. It is worthwhile to explore whether economic pressure would be linked to parental control behavior, and, if so, how they are related.

The current study sought to examine whether economic pressure is an antecedent of parental control behaviors under the context of family stress model (R. D. Conger et al., 1992). Furthermore, the introduction of family control behaviors expands the original FSM. Instead of examining nurturant-involved parenting, it is worthwhile to explore whether the model still holds with the effect of parental control on adolescent internalizing and externalizing behaviors.

Literature Review

Parental Control Behaviors and Child Outcomes

Although the conceptual existence of parental control was acknowledged long ago (Baumrind, 1967), it has often been aggregated into broader types of parenting. One good example is Baumrind's (Baumrind, 1967) typological approach, where she used a combination of parental support and behavioral control in defining four important dimensions of parenting, which later forms three well-known different parenting styles: authoritarian parenting, authoritative parenting, and permissive parenting. Although a large amount of research has emerged in the ensuing decades connecting the parenting styles mentioned above with different child outcomes, the embedded parental control aspects were often overlooked by researchers.

Early research on the descriptions and distinctions between behavioral control and psychological control can be traced back to Schaefer's (1956) factor analyses of parent behavior inventory, where firm control versus lax control, and psychological autonomy versus psychological control, were first introduced. Since then, researchers such as L Steinberg (1990)

and Barber (1996), have devoted attention to the research on disaggregating parenting typologies to better understand underlying forms of parental control behaviors.

Steinberg (1990) provided the first detailed description of parental behavioral control and psychological control. Based on earlier work (Laurence Steinberg, Elmen, & Mounts, 1989), Steinberg (1990) stated that the core distinction between the two forms of control is that psychological control adversely affects adolescent development of autonomy and self-direction, while behavioral control provides needed guidance and supervision for adolescents' positive socialization.

More recently, Barber and his colleagues (Barber, 1996; Barber et al., 2002; Barber et al., 1994; Barber et al., 2005) further elaborated the distinction between the two forms of parental control behaviors, and how they were linked with adolescent adjustment. Based on Barber's work, behavioral control refers to regulation, awareness of activities, and restrictions of behavior. Thus, parental monitoring, usually defined as parents' knowledge and supervision of their children's location, activities, and peers, became a fundamental component of effective behavioral control (Brown, Mounts, Lamborn, & Steinberg, 1993; Dishion, Patterson, Stoolmiller, & Skinner, 1991; Patterson, Reid, & Dishion, 1992). In contrast, psychological control refers to parental intrusiveness, love withdrawal, and guilt induction, where parents try to inject their own thoughts into children's development of independence and self-identity by undermining their psychological development (Barber, 1996; Barber et al., 1994).

Research has consistently found that parental psychological control was related to both internalizing problems such as depression (e.g., Soenens et al., 2012), anxiety (e.g., Nanda, Kotchick, & Grover, 2012) and externalizing problems, for example, aggression (e.g., Nelson et al., 2013), whereas behavioral control was related to improved psychosocial functioning (e.g.,

competence, self-regulation), and lower levels of maladaptation (e.g., externalized problem behaviors). To better understand the different results, it is important to know the nature of control. It might be confusing that two types of parental control behavior lead to different and sometimes opposite outcomes on children and adolescent. As suggested by Steinberg (1990; Laurence Steinberg, Fletcher, & Darling, 1994), forms of control can be either inhibitive (e.g., psychological control) or facilitative (e.g., behavioral control) of positive human development. However, once understood, it is what the parents are trying to control rather than the quantity of control behavior that underlies the different results between psychological and behavioral control (Barber, 1996).

In general, a higher level of behavioral control has been associated with lower levels of behavior problems (Barber, 1996; Barber et al., 1994; Pettit et al., 2001), and a higher level of psychological control has been linked to disorganized social-emotional development (Shulman, Collins, & Dital, 1993; Soenens, Elliot, et al., 2005; Laurence Steinberg et al., 1989), higher rates of both internalizing problems (e.g., Barber, 1996; Pettit et al., 2001) and externalizing problems (e.g., Barber & Olsen, 1997; K. J. Conger, Conger, & Scaramella, 1997), as well as poor academic performances (e.g., Barber, 1996; Steinberg et al., 1989).

Prior research has been examined here primarily in terms of how those two forms of parental control behavior predicting child outcomes. However, only a few studies have been done to examine the antecedents of both parental psychological control and behavioral control behaviors (Barber & Harmon, 2002), and they found a complex and reciprocally related set of factors. Buehler, Benson, and Gerard (2006) examined how parenting helps explain the association between inter-parental hostility (e.g., marital conflict) and adolescent problem behavior with a sample of early adolescents and their married parents. They found that the

association between inter-parental hostility and adolescent externalizing problems was mediated uniquely by fathers' and mothers' harshness, lower levels of fathers' behavioral control, and mothers' psychological control. In other words, the findings showed that inter-parental hostility influenced fathers' behavioral control behavior and mothers' psychological control behavior, which in turn affected child externalizing behaviors. In addition, the association between inter-parental hostility and adolescent internalizing behavior was found to be mediated uniquely by mothers' harshness, psychological control, and lower levels of acceptance. These patterns were similar regardless of the gender of the child.

Pettit and colleagues (Pettit & Laird, 2002; Pettit et al., 2001) found that proactive parenting style predicted parental behavior control while harsh parenting predicted parental psychological control in early adolescence. They also found that higher socioeconomic status, child gender, and intact marital status had a significant influence on mother-reported behavioral control. In addition, consistent with prior research, they found high levels of parental behavioral control were associated with lower levels of delinquent behavior, and psychological control was associated with higher levels of anxiety, depression, and delinquent behavior. Subsequent research revealed moderate effects of childhood adjustment problems on proactive parenting in their later lives. Smetana and colleagues (Smetana & Daddis, 2002) found early proactive involvement predicted later psychological control only among children with fewer externalizing problems. In contrast, proactive parenting predicted more regulation only for children with more externalizing problems. Besides, according to Pettit and Laird (2002), it is possible that behaviorally controlling mothers who are overly watchful in early childhood may use greater level of psychological control in early adolescence because of their difficulty with the autonomy issues.

Compared to the limited research on the potential determinants of behavioral control, more research has been done on the investigation of possible antecedents for parental psychological control behavior. Barber, Bean, and Erickson (2002) suggested three groups of antecedents as potential determinants of psychological control. The first group of potential determinants involves contextual and/or environmental factors that may have impacts on parenting. Evidence suggests differences in psychological control among demographic and family structure groups. For example, research has shown that African Americans have reported higher levels of psychological control than European Americans (Barber, 1996). The second group of potential determinants refers to parent personalities and characteristics. Example includes work by Soenens, Vansteenkiste, Duriez, and Goossens' (2006), which suggested that parents' maladaptive perfectionism was associated with their psychological control on the children. The third group of potential determinants are child factors, which shows the reciprocal perspective of parent-child relationship. Specifically, research has shown that adolescents' increasing depression and delinquent behavior were associated with more psychological control from their parents (Barber, 1996; Pettit et al., 2001; Soenens, Luyckx, Vansteenkiste, Duriez, & Goossens, 2008).

Laird (2011) tested the hypothesized association between the three groups of potential antecedents and parental control behaviors in a study of mothers and early adolescents. Results showed complex and diverse associations based on the sources of response and types of control behavior. The findings in Laird's study showed child factors were unique predictors of adolescent-reported behavioral and psychological control while contextual factors and parent personality only predict psychological control behaviors. Mother characteristics were associated with mother-reported psychological control but were not associated with behavioral control.

Depressed mood was the only child factor associated with both forms of control behaviors, but the effects were in opposite directions with greater depressed moods associated with more psychological control and less behavior control. Given the inconsistent results, further study should be done on investigating potential antecedents of parental control behaviors.

Family Stress Model

The family stress model of economic hardship was developed based on the study of European American families living in the rural Midwest (K. J. Conger et al., 2000; R. D. Conger & Elder Jr, 1994; R. D. Conger, Rueter, & Elder Jr, 1999). The model proposes that high levels of financial stress experienced by parents are associated with problem behavior in adolescents. The family stress model examines a series of mediated associations among economic hardship, economic pressure, mood of caregivers, caregivers' relationship, parenting practices, and child adjustment. The model hypothesizes that economic hardship leads to parents' feelings of economic pressure, and this pressure, in turn, creates feelings of distress, such as feelings of depression, anxiety, and anger, in both parents (R. D. Conger & Donnellan, 2007; Duncan & Magnuson, 2003). Consistent feelings of distress over time negatively influence parents' ability to communicate, nurture, or engage in positive parenting activities. (Brody & Flor, 1997; R. D. Conger & Conger, 2002; R. D. Conger, Ge, Elder, Lorenz, & Simons, 1994; Formoso et al., 2007). Greater emotional distress also affects parenting practices, both directly and indirectly through effects on inter-parental relationships (e.g., marital conflict). According to the model, emotional distress and economic pressure both predict increased conflict and reduced warmth and support in the relations between caregivers. Disrupted parenting practices ultimately impact youths' emotional, behavioral, and physical outcomes. Furthermore, when families experience economic hardship, children would experience a hard time in achieving positive adjustment and

chances of internalizing and externalizing problems would increase (R. D. Conger & Conger, 2002; Gudmunson, Beutler, Israelsen, McCoy, & Hill, 2007).

The original sample of the family stress model (R. D. Conger et al., 1992, 1993; R. D. Conger & Elder Jr, 1994) study was from the Iowa Youth and Families Project, which was launched in 1987 with the goal of investigating the human consequences of the Farm Crisis that began in the late 1970s. Only European American families were included in the original model because there were too few minority families in rural Iowa to generate meaningful data. In addition, families included in the sample had two parents with a seventh-grade adolescent, and a sibling within 4 years of age of the seventh grader. Many later studies were able to replicate the model using samples of different ethnicities (e.g., Solantaus et al., 2004), geographic locations (e.g., R. D. Conger et al., 2002), family structures and child ages (e.g., Scaramella, Sohr-Preston, Callahan, & Mirabile, 2008). For example, Conger and his colleagues (1995) replicated the original model with a sample of 206 families from the Oregon Youth Study, and 451 families from the Iowa youth and Families Project. They found that parental stress was related to child adjustment through stress-related parental depression and correlated with disrupted discipline practices. The mediation model they proposed was consistent with the data from both the Oregon and the Iowa samples for mothers and children, but was less clear for fathers and children. Later, Conger and his colleagues (2002) examined the effect of economic pressure among 422 African American families with two-caregivers and a 10-11 year old focal child from the Family and Community Health Study. They replicated the prior studies and found that economic hardship positively related to economic pressure; economic pressure was related to emotional distress of caregivers, which in turn influenced caregiver relationship; the problems in caregiver

relationship then affected poor parenting practices, which predicted lower positive child adjustment and higher internalizing and externalizing problems.

The family stress model described a series of mediation effects, including depressed mood, caregiver relations and parenting behavior, through which economic hardship affects child adjustment. However, the model does not provide any comprehensive explanation of parenting behavior and child adjustment. The theoretical model starts with the association between economic hardship and economic pressure. Economic hardship, measured in the form of low family per capita income and negative financial events, is proposed to have an indirect influence on emotions, behaviors or relationships of family members through economic pressure (R. D. Conger et al., 2002). Economic pressure is a construct that measures the objective tough experience caused by the economic hardship. The model follows Berkowitz's (1989) reformulation of frustration-aggression hypothesis, where he stated that stressful, frustrating, or painful events and experiences are related to increased emotional arousal varies from depression to anger (R. D. Conger et al., 2002). In terms of the model, economic pressure reflects the painful conditions in Berkowitz's hypothesis that increase depressed mood in caregivers.

Following the association between economic pressure and depressed mood, the model proposes that caregivers' depressed mood will decrease nurturant-involved parenting both directly and indirectly through the interactions and relationship between caregivers (R. D. Conger & Elder Jr, 1994; Pleck & Hofferth, 2008; Schacht, Cummings, & Davies, 2009; Sturge-Apple, Davies, Boker, & Cummings, 2004; Sturge-Apple, Davies, Winter, Cummings, & Schermerhorn, 2008). Nurturant-involved parenting concerns two main dimensions, where the first dimension is the involvement of parent through monitoring and rule setting; the second dimension refers to parent's supportiveness while avoiding overly rough behavior (R. D. Conger

et al., 1992, 1993). Both of the two dimensions can be traced to the characteristics of parental behavioral control. Although several studies have provided increasing support for the proposed association between caregiver's depressed mood and parenting (Benner & Kim, 2010; Brody et al., 1994; R. D. Conger et al., 1992, 1993; R. D. Conger & Elder Jr, 1994; Davies & Cummings, 1994; Harold & Conger, 1997; Linver, Brooks-Gunn, & Kohen, 2002; Mistry et al., 2004; Solantaus et al., 2004), to date the parenting construct in the model has most commonly been measured on the aggregated level.

The final step of the model proposes the association between nurturant-involved parenting and child adjustment, where inconsistent results have been found in early studies. With a number of studies showing that parental warmth, support and involvement (i.e., nurturant-involved parenting) have positive impact on child adjustment (e.g., R. D. Conger et al., 1992, 1993; Melby & Conger, 1996; Scaramella, Conger, & Simons, 1999), samples with African American families different associations among the two constructs were found from studies with samples of African American families. Some of the studies have found that the nurturant-involved parenting promote capability and reduce problem behaviors among African American children and adolescents (e.g., Gutman & Eccles, 1999; McLoyd, Jayaratne, Ceballo, & Borquez, 1994), whereas other studies have stated that a more controlling parenting style will be more beneficial for this population because of cultural differences (Brody & Flor, 1998; Deater-Deckard & Dodge, 1997).

The Current Study

The current study addresses several limitations and provide some extensions of existing research regarding parental control behavior and family stress model. First, existing literature on parental control behavior has primarily explored how two forms of parental control predict child

adjustments, only a few studies have examined the antecedents of parental psychological control and behavioral control behaviors (Barber et al., 2002). Within the limited studies that investigated the potential antecedents of parental control behaviors, none of the research has examined the effects of economic hardship as its specific goal on parental control behavior.

Second, previous studies using the family stress model have generally focused on the direct and indirect effects of marital conflicts and caregiver's depressed moods on nurturant-involved parenting (R. D. Conger et al., 1992, 1993; R. D. Conger et al., 2002), very few studies have tried to examine the disaggregated parenting measures that reflect the dimensions of parental control behaviors. It is worthwhile to examine whether controlling parenting has impact on child internalizing and externalizing behaviors and how the association works in the context of the family stress model.

Finally, previous research with family stress model has examined effect of economic pressure on only one child outcome measure at a time. Examples include latent constructs, such as child adjustment, child internalizing behavior, child externalizing behavior, as well as specific child outcome, such as school engagement and suicidal ideation (e.g., Campbell, Pierce, Moore, Marakovitz, & Newby, 1996; Yoder & Hoyt, 2005). None of the research has tried to investigate the associations between parenting behaviors and both internalizing behavior and externalizing behavior in one model. It is helpful to see how both internalizing behavior and externalizing behavior were affected at the same time within the family stress model, whether they change in the same direction or opposite directions. It is also important in helping us better test the different associations between psychological control and behavioral control on internalizing behaviors and externalizing behaviors.

The theoretical model to be tested is illustrated in Figure 1 (the hypothesized paths are labeled with letters and the expected direction in parentheses). First, it is hypothesized that family economic pressure will be positively associated with primary caregiver's depressed mood (Path A) and marital conflict (Path B). Second, it is hypothesized that primary caregiver depressed mood will be positively associated with marital conflict (Path C).

[Insert Figure 1 here]

Third, primary caregiver depressed mood is hypothesized to be positively associated with parental psychological control behavior (Path D) and negatively associated with parental behavioral control behavior (Path E). Fourth, it is hypothesized that marital conflict is positively associated with parental psychological control behavior (Path F) and negatively associated with parental behavioral control behavior (Path G). Fifth, it is hypothesized that parental psychological control is positively related to both child internalizing behavior (Path H) and externalizing behavior (Path I). Sixth, parental behavioral control is hypothesized to be negatively associated with both child internalizing behavior (Path J) and externalizing behavior (Path K).

Finally, it is hypothesized that economic pressure will be indirectly related to parental control behaviors (via caregiver's depressed mood and marital conflict) and child outcomes (via depressed mood, marital conflict and parental control behaviors). These hypotheses of indirect effect are consistent with family stress model and are supported by previous research.

Method

Data and Sample

The sample for this study was taken from Wave 3 and 5 of the Flourishing Family Project (FFP), an ongoing, longitudinal study of inner family life involving families randomly selected

with a child between the ages of 10 and 14 at the beginning of the study (2007). The project consisted of 500 families at wave 1, and the retention rate was 96% at Wave 2 ($N = 480$), 91.8 % at Wave 3 ($N = 459$), 93.8 % at Wave 4 ($N = 469$), and 92.6 % at Wave 5 ($N=463$). The retention rate for the FFP averages over 92% for the 5 waves. Wave 1, 2, and 4 were not used because measures were not available. Families in the project were give a stipend of 100 dollars per person for their participation. All procedures of the data collection process were approved by university Institutional Review Boards.

The current sample included 308 mother– child dyads with a child between the ages of 11 and 15 at Time 3 (M age of child = 13.23, $SD = .94$, 50% female). This sample was selected from the larger sample based on the marital status of the mother and whether she is the primary caregiver in the family. All the mothers included in this study are married at wave 3. It is worth noting that only 27 of the 500 families in the original sample have father listed as primary caregiver in the family. Participant mothers' averaged 45.23 years of age ($SD = 5.58$), while the mean age for the children was 15.23 years ($SD = .94$). The average monthly income was \$6,945 ($SD = \$5,434$). The large standard deviations for income reflect the deliberate sampling of participants from low, moderate, and high income neighborhoods. Among the 308 families, 150 has female child and 152 has male child with 6 families didn't report the gender of their children. Regarding ethnicity, 75% of the participants were European American, 4% were African American, and 19% indicated that they were multi-ethnic. Ten percent of families reported an income less than \$40,000 per year, 48% made between \$40,000 and \$100,000 a year, and 33% made more than \$100,000 per year; with 56% of mothers reporting working now and 19% full-time homemaker. Regarding education level, 69% of mothers reported having a bachelor's degree or higher.

Procedure

Families in the FFP were selected from a Northwestern city in the United States and were first interviewed in 2007 for Wave 1 data collection. Participant families were randomly selected from a purchased national telephone survey database (Polk Directories/InfoUSA) based on their eligibility, and all families were contacted based on multi-stage recruitment protocol. Among the 692 eligible families contacted, 423 of them agreed to participate. However, the Polk Directory national database was generated using telephone, magazine, and Internet subscription reports; so families of lower SES were underrepresented. To better represent the demographics of the local area, 77 families were recruited into the study through methods such as referral and fliers, resulting in 500 total families participating at Wave 1. Through these approaches, the project was able to increase the socio-economic and ethnic diversity of the sample and provide a better sample that resembles the local populations. At each wave, interviewers visited the participant family's home and conducted an assessment that included 1-hr video-taped interview interactions, as well as 1.5-hr self-administered questionnaires (participants were encouraged to complete questionnaires in separate rooms and not to discuss answers during administration). Both parents and children completed informed consent documents at the start of each in-home visit, and the project was approved by the institutional review board at the university from which the research originated.

The most frequent reasons cited by families for not wanting to participate in the study were lack of time and concerns about privacy. It is important to note that there were very few missing data at either time point. As interviewers collected each segment of the in-home interview, questionnaires were screened for missing answers and double marking.

Measures

Economic Pressure

Economic pressure were assessed using a 13-item measure modified version of financial concerns and financial constraints (Spilman & Burzette, 2006) at Wave 3 (2009). Three subscales were included in this modified measure: Financial Concerns, Financial Constraints, and Perceptions of Financial Constraints. All these subscales were used to create a latent variable for economic pressure.

Among all three subscales, family financial concerns were assessed using five self-report items adapted from the Family Transitions Project (Spilman & Burzette, 2006). Likert-scale responses ranged from 1 (strongly disagree) to 5 (strongly agree), with higher scores reflecting greater financial concerns. Sample questions included, “I have trouble sleeping because of my financial problems,” and “My financial situation is much worse this year than it was a year ago.” To assess family financial constraints, participants responded to six items taken from the Family Transitions Project (Spilman & Burzette, 2006). Likert-scale responses ranged from 1 (strongly disagree) to 5 (strongly agree), with higher scores indicating more perceived constraints in meeting material needs after reverse-coding. Sample items include “I have enough money to afford the kind of place to live in that I should have” and “I have enough money to afford the kind of food that I need.” Reliability for this measure has been found to be strong ($\alpha = .90$) in other studies (e.g., Spilman & Burzette, 2006). To assess the perception of financial constraints, participants responded to 2 items include “During the past 12 months, how much difficulty have you had in paying your bills?,” and “Over the past 12 months, at the end of each month, do you generally end up with...”. Likert-scale responses ranged from 1 (no difficulty at all) to 5 (a great

bit of difficulty) and 1 (not enough money to make ends meet) to 4 (more than enough money left over) respectively.

Primary Caregiver Depressed Mood

Primary caregiver's mood was measured with anxiety symptoms scales and depressive symptoms scales (Burns, 1989) at Wave 3 (2009). A latent variable was built from the two anxiety symptoms subscale and depression symptom scale.

Parental anxiety was assessed using an eight-item self-report measure, based on the Burns Anxiety Inventory (Burns, 1989). Items were taken from two subscales of the Burns Anxiety inventory: the Anxious Feelings scale (items 1-6; complete subscale) and the Anxious Thoughts scale (items 7 and 8; originally 11 items). Participants responded to items using a 4-point Likert scale asking how often they experienced thoughts or feelings with response options ranging from 0 (not at all) to 3 (a lot), with higher scores representing greater anxiety or anxiety symptoms. Sample items include "feeling that things around you are strange, unreal, or foggy" (anxious feeling subscale) and "racing thoughts or having your mind jump from one thing to the next" (anxious thoughts subscale). Cronbach's alpha reliability coefficients for the current sample is .77.

Parental depression-related symptoms were assessed using 11 items from the Center for Epidemiologic Studies-Depression scale (CES-D, Radloff, 1977). Adults responded based on a 3-point Likert scale ranging from 1 (never) to 3 (most of the time). Sample questions include "I felt depressed," "people were unfriendly" and "I could not get 'going.'" Following reverse-coding of two items, higher scores indicate higher levels of depressive symptoms. Past research indicates Cronbach's Alpha reliability coefficients to be .85 in the general population and .90 in the clinical population (Radloff, 1977). For this sample, reliability was found to be .76.

Marital Conflict

To assess marital conflict topics, participants responded to eight common problems experienced in couple relationships in terms of how often each problem occurs. Items were selected from the RELATE assessment battery (Busby, Holman, & Taniguchi, 2001), including items such as, “rearing children,” “intimacy/sexuality,” and “financial matters.” Responses were based on a 5-point Likert scale ranging from 1 (never) to 5 (very often). Previous reliability (Busby, Holman, & Taniguchi, 2001) for this measure was found to be .80 (males) and .83 (females). The reliability for this sample (Cronbach’s Alpha) was found to be .69.

Parental Psychological Control

Psychological Control Scale-Youth Self Report (Barber 1996) were used to assess adolescents’ perceptions of their mothers’ psychological control at Wave 3 (2009). Each item was asked separately regarding the adolescents’ fathers and mothers (only response regarding mothers were used here because of the sample we chose). Sample questions included “My parent tries to change how I feel or think about things” and “My parent will avoid looking at me when I have disappointed her/him.” Responses were based on a 5-point Likert scale ranging from 1 (never) to 5 (very often) and a latent variable was created based on parcel scores. The original Cronbach’s alpha reliability coefficients for this measure were found to be .83 for mothers and fathers (Barber 1996). In the current sample, the Cronbach’s alpha coefficients were .84 for adolescents’ responses about their mothers’ psychological control.

Parental Behavioral Control

A 12-item measure modified version of parental monitoring behaviors (Kerr & Stattin, 2000) were used to assess adolescents’ perceptions of their parents’ behavioral control behaviors at Wave 3 (2009). There are three subscales in this modified measure, including Parental

Knowledge, Child Disclosure, and Parental Solicitation. All these subscales were used to create a latent variable for parents' behavioral control behaviors. Sample questions for Parental Knowledge included "When I am not at home, my parent knows where I am" and "My parent knows who my friends are." Questions regarding Parental Disclosure included "I tell my parent about my day at school" and "I tell my parent what I have done with friends when I get home." Example questions for Parental Solicitation included "My parent talks with my friends when they come to our house" and "My parent start conversations with me about things that happen at school." Adolescents answered how often each question occurred with their fathers and mothers separately (only response regarding mothers were used here because of the sample we choose). Responses were based on a 5-point Likert scale ranging from 1 (never) to 5 (always). Higher scores on items 1-4 indicate more knowledge about the child and his/her behavior, higher scores on items 5-8 indicate more disclosure by the child, and higher scores on items 9-12 indicate higher levels of parent solicitation. Kerr and Stattin (2000) found the reliability to be .82 (knowledge), .80 (disclosure), and .69 (solicitation). In the current sample, Cronbach's alpha coefficients were found to be .76 (knowledge), .76 (disclosure), and .76 (solicitation) for adolescents' perceptions of parental behavioral control for their mothers.

Child Internalizing Behavior

Internalizing behavior problems were measured using a 13-item depression and anxiety-related items (Barber et al., 2005). Sample items included: "I am unhappy, sad or depressed" and "I feel worthless or inferior." Responses ranged from 0 (not true) to 2 (very true or often true) with higher scores indicate higher levels of internalizing problem behaviors. Cronbach's alpha coefficients were found to be .86 for the current sample. A latent variable was created for internalizing behavior measures using parcel scores from child reports.

Child Externalizing Behavior

Externalizing behaviors were measured using a 9-item measure of externalizing problem behavior at Wave 5 (Barber et al., 2005). Adolescents responded to nine-items, with sample items that include “I lie or cheat” and “I steal things from places other than home.” Responses ranged from 0 (not true) to 2 (very true or often true) with higher scores representing higher levels of externalizing behaviors. Cronbach’s alpha coefficients were found to be .79 for the current sample. A latent variable was created for externalizing behavior measures using parcel scores from child reports.

Control variables

Literature on parental behavioral control and psychological control is inconsistent with their findings on the impact of child or adolescent gender on their developmental outcomes. Some studies finding no gender differences (e.g., Herman, Dornbusch, Herron, & Herting, 1997) whereas others reporting model of girls showed stronger associations than models of boys (e.g., Conger, Conger, & Scaramella, 1997). As a result, the current study included gender from wave one of the data set as a control. In addition, age of adolescent in wave three, and ethnicity of adolescent in wave 1 were also included. In the structural equation model, paths were created between these variables and all endogenous variables in the model.

Analytic Plan

Data analyses were conducted using the IBM SPSS Statistics 23 and structural equation modeling was conducted using Mplus 7 (Muthén & Muthén, 2007). Structural equation modeling analyses was conducted to test the theoretical model shown in Figure 1. Using SEM is beneficial because it allows us to test our theoretical model with minimum bias and errors in estimates. Representative constructs were created through latent variables in the model, which will be free

of random errors (Markus, 2012). Child's gender, age, and race were treated as control variables. Thus, they will be included in the model as predictors of all the other variables. The testing and refining of theoretical models involved several sequential steps as illustrated in the following sections.

Treatment of Missing Data

Little's missing completely at random (MCAR) test (Little, 1988) was performed in SPSS 23, with the null hypothesis that data were missing completely at random not rejected, with $\chi^2(47) = 58.556, p\text{-value} = .12$. Then, all missing values in the models were estimated in Mplus using the Full Information Maximum Likelihood (FIML) method.

Creating Latent Variables

Latent variables were created for economic pressure, primary caregiver mood, parental psychological control, parental behavioral control, child internalizing behavior, and child externalizing behavior. For economic pressure, primary caregiver mood, and parental behavioral control, the latent variable was constructed with subscales from the measures as indicators. For the parental psychological control, child internalizing behavior, and child externalizing behavior, three parcels were formed for each measure as indicators for these latent variables. To create the parcels, exploratory factor analysis was conducted in SPSS 21, all items in the measure were forced to load on one factor, and then items were ranked from the highest loading to the lowest. Then item was selected for each of the three indicators to the average item-total correlation for items within each measured indicator was similar as was the number of items assigned for each indicator. That is, items were assigned a number one to number three based on their loading ranking with all the ones assigned to indicator 1, all the twos assigned to indicator 2 and all the

threes to indicator 3. The mean score of items within each indicator was used as a summary score of that indicator.

Testing the Measurement and Hypothesized Models

There are two steps in building a sound structural equation model. First is to build and refine the measurement model, and second is to test and refine the hypothesized theoretical structural model. The measurement models provided information on the best model of fit I can achieve, as well as factor loadings and correlations among variables in the hypothesized theoretical model, whereas the structural model tests the hypothesized relationships among variables and modification indices.

Results

Results indicated that the measurement model provided an adequate fit to the data, $\chi^2(115, N = 291) = 169.778$ with $p < .001$, root-mean-square error of approximation (RMSEA) = .040 and comparative fit index (CFI) = .977. As shown in Table 1, loadings of the measured variables on the latent variables were all highly significant.

The correlations among the variables included in the model are presented in Table 2, where relationships among these variables were generally consistent with expectations. For example, parental psychological control correlated positively with child externalizing behavior, parental behavioral control correlated positively with child internalizing behavior. Unexpected findings included not statistically significant relationship between the child externalizing behavior and marital conflict.

As shown in Figure 2, after getting the overall fit information of the data from the measurement model, the researcher moved on to the analyses evaluating the fit of the hypothesized structural equation model to the data. The hypothesized model was also found to

provide an adequate fit to the data, $\chi^2(123, N = 291) = 176.55$ with $p < .001$, RMSEA = .039 and CFI = .977, which is similar as the measurement model since we kept most paths in the measurement model. Standardized coefficients for the paths included in the model are shown in Figure 2. As expected, strong positive relationship was shown between parental psychological control and child internalizing behavior ($\beta = .257, p < .001$); parental behavioral control was negatively associated with child externalizing behavior ($\beta = -.349, p < .001$). Also as expected, Family economic pressure was positively associated with primary caregiver's mood ($\beta = .481, p < .001$) and marital conflict ($\beta = .202, p < .01$); primary caregiver's mood was positively associated with marital conflict ($\beta = .242, p < .01$); marital conflict was positively associated with parental psychological control ($\beta = .169, p < .05$). Some unexpected results include, no statistically significant association between parental psychological control and child externalizing behavior, also no significant association between parental behavioral control and child internalizing behavior. In addition, marital conflict is not associated with parental behavioral control. Overall, parental psychological control and parental behavioral control accounted for 16.1% of the variation in child externalizing behavior and 6% of child internalizing behavior. Moreover, the impact of family economic pressure only affect child internalizing behavior through parental psychological control and marital conflict.

Discussion

The purpose of the current study was to investigate the developmental implications of economic hardship on parental behavioral control and parental psychological control with a population of European American families living in urban areas with two caregivers in the household in the context of the recession in 2007. The study also examined how parental control behaviors influence child externalizing behaviors and internalizing behaviors outcomes.

Despite the potential barriers to replicate the original model, such as possible cultural differences in the definition of economic hardship with different background, sensitiveness to economic pressure with different income level, and all mother as primary caregiver, the overall fit and pathways of the theoretical model were quite similar with the earlier studies, indicating some generalizability of the earlier findings to the current population.

Comparing to the earlier study with family stress model, which were tested with samples of rural European American families and rural African American Families, the present study showed some consistent findings. First, findings suggested that economic pressure was positively associated with primary caregiver's depressed mood and the depressed mood of caregiver was positively associated with marital conflict. Taken together, these findings make a good contribution to our understanding of the family stress model in this urban population. First, because of the relatively stable and high income of the families in the study, we predicted that economic pressure might not provide as large an influence on caregiver as earlier studies did with rural samples. Nevertheless, the results showed very consistent findings. Based on the current result, it can be concluded that impact of economic pressure is applicable among rural and urban families, regardless of their income stability and level. However, as earlier studies have found income levels of the sample have different impact on family relations and individual maladjustment (K. J. Conger et al., 2000; R. D. Conger et al., 2002), it is possible that other factors, for example, negative financial events, also influenced family economic pressure. To get a better understanding of these findings, future studies should explore more on what factors have impact on economic pressure of families from different populations. Second, similar as earlier research, economic pressure variable was directly associated with child internalizing behaviors

and externalizing behaviors in the measurement model, however, the association were no longer significant in the theoretical models.

Another important finding from the current study that was also consistent with earlier studies was the theoretical significant mediating paths between economic pressure and child outcomes proposed by the family stress model. As evidences of the mediation effect, significant zero-order associations shown in the measurement model between economic pressure and parental psychological control, child internalizing behavior and child externalizing behavior became non-significant in the theoretical model. These results supported the original hypothesis that economic pressure influences family relationships and child outcomes through emotional distress of the caregiver. Furthermore, depressed mood was indirectly associated with child outcomes through caregiver conflict and parental control psychological control while not behavioral control.

In addition, consistent with Barber's model (Barber et al., 1994), the negative association between psychological control and behavioral control confirmed, once again, the distinction between the two constructs. Parents who focus more on psychological development of their children tend to care less about restricting their children's behavior. It is possible that psychological controlling parents thought psychological control was enough for their children or they might simply do not have enough time and energy to implement both control at the same time. Further efforts are needed to explore more about these two kinds of parental control behavior. Along the same line, based on child report, parental psychological control was significant and positively associated with child internalizing behaviors while parental behavioral control was significant and negatively associated with child externalizing behaviors. These

findings provide support for the theory that psychological control and behavioral control were empirically independent dimensions of family interaction.

One of the findings that was not shown in the previous studies involved the presence of a pathway between economic pressure and marital conflict. This new finding might be a result of not including secondary caregiver depressed mood in the model. As shown in earlier studies, economic pressure was significantly associated with secondary caregiver depressed mood, especially for African American families (R. D. Conger et al., 2002). The missing of the secondary caregiver might have left the unexplained variance from economic pressure to marital conflict, which was shown in the model as a partial mediation from economic pressure to marital conflict through primary caregiver depressed mood.

Another finding shown in present study that was new compared with the earlier studies came from the introduction of parental control behaviors. Findings showed a statistically significant association between marital conflict and parental psychological control but a non-significant path between marital conflict and parental behavioral control. It was not surprising to see the significant positive path from marital conflict to parental psychological control, since research has found that deterioration of marital relationship may increase the use of psychological control by parents to keep their children in emotional alliance with them (see, Fauber, Forehand, Thomas, & Wierson, 1990).

However, the non-significant association between marital conflict and parental behavioral control was a little unexpected and contradicted with Patterson's work where his study suggested parents would become increasingly occupied by marital problems and began to pay less attention to the monitoring of their children (Patterson & Stouthamer-Loeber, 1984). One possible explanation would be the different measures used in the current study and those used by

Patterson and others. The construct for parental behavioral control was based on monitoring in the current study, while the measure used by Patterson involved monitoring, discipline, problem solving and reinforcement. As such, the parental behavioral control construct in the current study may represent only the monitoring branch of Patterson's study. Nevertheless, earlier research which used the monitoring construct showed same non-significant association from marital conflict (Fauber et al., 1990).

Finally, no direct effect from marital conflict to child outcomes was observed in the current study. Although former studies have found significant direct effects from marital conflict to child externalizing behavior, associations were not significant in the current study, not even in the measurement model.

Limitations and Future Directions

Some limitations to the current study should be noted. First is the limitation of the data set. The sample only consisted of families from a large west-coast city, who were mainly well-educated and had relative stable and high incomes. Therefore, it may not be generalizable to a larger population with lower socioeconomic status. Research has shown that parenting styles vary as a function of socioeconomic status (Hoff, Laursen, Tardif, & Bornstein, 2002). As a result, it is possible that the use of psychological control behaviors and their correlates may differ in parents of children who experience higher level of economic pressures because of the lower socioeconomic status. However, the results of the current study provide an important empirical foundation from which future research can be conducted examining the associations with a sample from lower socioeconomic status populations. Also, given the relative unstable economic situation throughout the world, findings from the present study may be relevant for a good portion of families in the United States that may be potential victims of the economic change. In

addition, the participants lacked ethnic diversity. Studies had suggested that what may be considered adaptive in one setting may be reversed in another because of the sociocultural context (e.g., Chao, 1994; Chao & Aque, 2009). Therefore, future studies are needed for replications of current findings in more ethnically diverse samples. Besides, the correlational nature in the first part of model, where the cross-sectional setting precludes prediction inferences between marital conflict and parental psychological behaviors is a notable limitation of the data. It is possible that associations between marital conflict and parental control behaviors were the other way around, that is, parental control behaviors cause marital conflict. Future work should test the model using other longitudinal data sets, where more clear casual effect between marital conflict and parental control behavior can be investigated.

Second, some of the construct used in the current model might be another limitation of the current study, such as the marital conflict and the negative child outcomes. Specifically, future study should replace the number of marital conflicts with a better measured construct that contains more dimensions of conflict. Also, inclusions of positive outcomes or specific outcomes that fit the future trend of child development concern are recommended. Possible examples of outcomes may include but not limited to child adjustment, obesity, Internet or gaming addiction, and even drinking behaviors. With all these possible positive and negative outcomes, research would not only provide refinement of the current study as well as the earlier theory, but also generate useful information for prevention and intervention efforts.

Finally, future work is needed in examining the mechanisms by which parental control behavior affect child outcomes. Although there have been few direct investigations of specific mechanisms of influence, little has been done on examining the mediator between the two ways

of parental control behaviors and both types of child negative outcomes (e.g., Mandara & Pikes, 2008; Soenens, Luyckx, Vansteenkiste, Duriez, et al., 2008).

In conclusion, this study integrates the current view of parental control by exploring the antecedents of parental control behaviors and offers new insights of how parental control affect child outcomes in the context of family stress model. Specifically, it appears that marital conflicts might explain some of the psychological control behaviors that parents use, but not so much on explaining behavioral control behavior. Moreover, parental psychological control and behavioral control are two distinct construct. Depending which type of parental control behavior parent focus on, it will lead to less tension on the other kind of control behavior and different child negative outcomes. These findings confirmed that internalizing behaviors were associated with parental psychological control behavior, while externalizing behaviors were related to parental behavioral control. It also suggested that intervention of marital conflicts may have positive impact on decreasing the use of parental behavioral control but not on behavioral control. Actually, because of the negative relationship between the two types of parental control behavior, the decrease in psychological control might even result in increase in behavioral control, which requires future research with longitudinal data set to examine the detail prediction relationships.

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Tables

Table 1. Loadings of Measured Variables on the Latent Variables						
Variable	Family Economic Pressure (ECPRE)	Primary Caregiver Mood	Parental Psychological Control (PPC)	Parental Behavioral Control (PBC)	Child Internalizing Behavior (INTB)	Child Externalizing Behavior (EXTB)
ECPRE Parcel 1	.901					
ECPRE Parcel 2	.889					
ECPRE Parcel 3	.895					
Anxiety		.740				
Depression		.833				
PPC Parcel 1			.819			
PPC Parcel 2			.826			
PPC Parcel 3			.779			
Parental Knowledge				.778		
Child Disclosure				.848		
Parental Solicitation				.706		
INTB Parcel 1					.790	
INTB Parcel 2					.865	
INTB Parcel 3					.862	
EXTB Parcel 1						.781
EXTB Parcel 2						.753
EXTB Parcel 3						.733

Note. The standardized loadings of the measured variables on the latent variables are shown.

Table 2. *Correlations among Variables in Model*

Variable	1	2	3	4	5	6	7
1. Family Economic Pressure	--						
2. Primary Caregiver Mood	.482***	--					
3. Marital Conflict	.319***	.339***	--				
4. Parental Psychological Control	.163*	.129	.197***	--			
5. Parental Behavioral Control	-.047	-.105	.003	-.383***	--		
6. Child Internalizing Behavior	.128*	.101	.099	.210**	.016	--	
7. Child Externalizing Behavior	.149*	.107	.021	.237**	-.387***	.240***	--

* $p < .05$ ** $p < .01$ *** $p < .001$, two-tailed.

Note: χ^2 (115, $N = 291$) = 169.778 with $p < .001$, RMSEA = .040, CFI = .977.

Figures

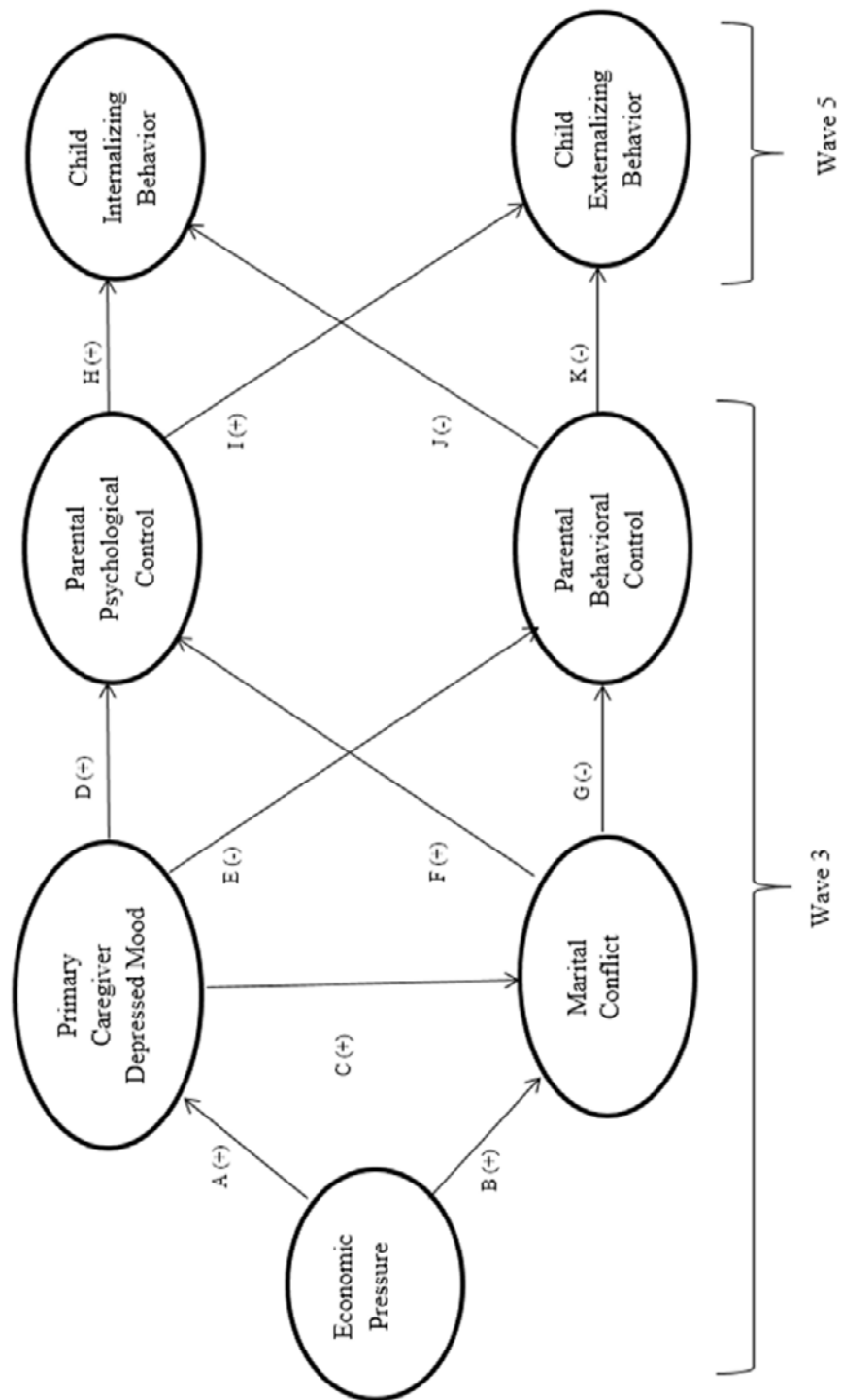


Figure 1. Hypothesized Theoretical Model

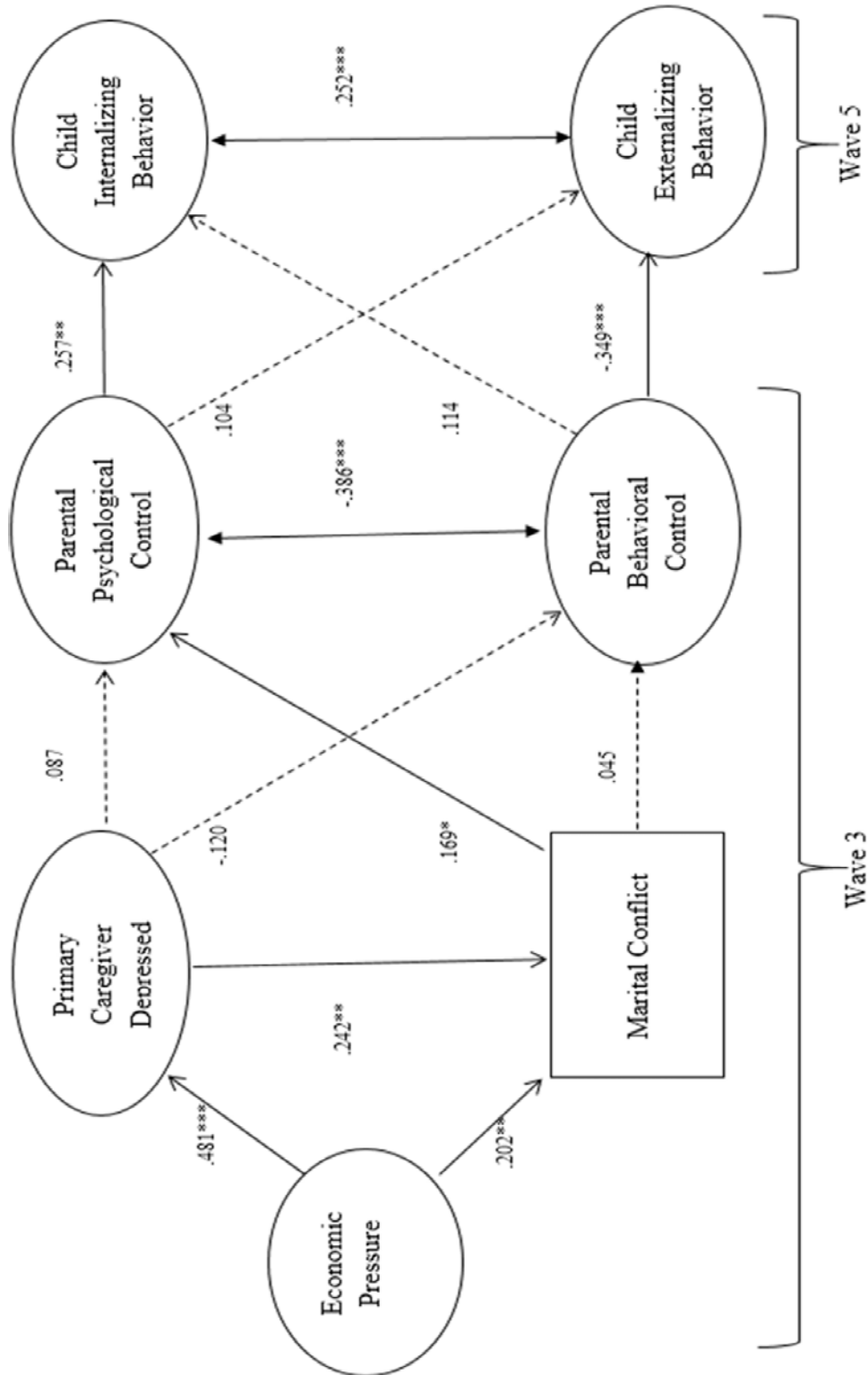


Figure 2. Results from the test of hypothesized path model, $\chi^2(123, N = 291) = 176.55$, $p < .001$; $RMSEA = 0.039$; $CFI = 0.977$. Standardized path coefficients are reported.

* $p < .05$ ** $p < .01$ *** $p < .001$

CHAPTER 3. THE ROLE OF NEEDS IN THE ASSOCIATION BETWEEN PARENTAL CONTROL BEHAVIORS AND CHILD DEVELOPMENTAL OUTCOMES: AN APPLICATION OF SELF-DETERMINATION THEORY

A paper to be submitted to *Journal of Research on Adolescence*

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Abstract

Associations between parental control and child outcomes, both internalizing and externalizing behaviors, have been established by existing literature. However, the pathways between parental control behaviors and child outcomes have not been thoroughly investigated. The current study addressed the gap by examining how parental psychological control and parental behavioral control contribute to the child's internalizing and externalizing behaviors, and whether the three basic psychological needs proposed in self-determination theory mediate the relation between two forms of parental control and children outcomes.

Results showed that parental control behaviors affect child internalizing and externalizing behavior differently through meeting children's autonomy, competency and relatedness needs. Significant indirect effects were shown between parental psychological control behaviors to child internalizing and externalizing behaviors through child autonomy. Meanwhile, psychological control had a significant indirect positive effect on internalizing behaviors through child competency while behavioral control showed a significant indirect negative effect on

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internalizing behaviors and no indirect effect was found on externalizing behaviors. In addition, no significant indirect effect was observed from the investigation of relatedness needs.

Implications, and recommendations for future research were presented aiming at integrating children's needs in examining parental control behavior.

Introduction

Early adolescence is a period of increased striving for autonomy (Steinberg, 1990). Decades of research on parenting behaviors have led to the disaggregation of parental control behaviors: parental behavioral control and parental psychological control (Barber et al., 1994; Schaefer, 1965; L Steinberg, 1990). Parental behavioral control refers supervision, regulation and awareness of adolescent's behaviors whereas psychological control refers to control of adolescent's development through psychological means such as intrusiveness and love withdrawal (Barber, 1996). Although research has found associations between the two forms of parental control behaviors to adolescent's antisocial behavior (e.g., externalizing behavior) and psychosocial adjustment (e.g., internalizing behavior), a limited body of research has examined the mechanisms within the association between parental control and adolescent's problem behaviors (e.g., Schiffrin et al., 2014). It is important to understand why and how parental behavioral control and psychological control works on adolescent's developmental outcomes.

It has been suggested by Ryan and Deci (2000) that parental control behaviors were related to negative developmental outcomes because their violation of meeting the basic needs conceptualized through self-determination theory (Edward L Deci & Ryan, 2008; Soenens & Vansteenkiste, 2010). Self-determination theory identified three basic needs that are necessary and fundamental for the healthy development and functioning of human beings. The need for autonomy implies people's desire of control and agency that entitle free choices and self-

controlled behaviors; the need of competency refers to one's feeling of competence and skillfulness in achieving goals when undertakes tasks and activities; the need of relatedness implies people's desire of being cared by, understood by, and affiliated with others (Edward L Deci & Ryan, 2008). On the other hand, normal development of adolescent requires sufficient autonomy, especially during the early adolescence period (L Steinberg, 1990). Parents need to find a balance between providing enough psychological freedom to meet adolescent's autonomy needs while still making rules and regulations and maintain a good relationship with their adolescent. If any one of the needs was not met, it may cause negative behaviors from the adolescent.

The primary goal of the current study was to examine how parental behavioral control and psychological control affect adolescent's internalizing and externalizing behaviors through their impact on the three basic needs proposed by self-determination theory. We hypothesized that (1) there would be a significant positive association between parental psychological control and child internalizing behavior as well as externalizing behavior; (2) there would be a significant negative association between parental behavioral control and child internalizing behavior as well as externalizing behavior; (3) the relation between parental controls and child behaviors would be mediated by autonomy, competency, and relatedness. With a better understanding of how parental behavioral control and psychological control work on adolescent's internalizing and externalizing behavior, researchers and teachers can provide interventions and educations to parents about the effect of over control or under control behavior, and parents can make adjustment to their parenting behaviors accordingly to meet the basic needs of their adolescent and help them develop in a healthy environment.

Literature Review

Parental Control Behavior and Child Outcomes

Much of the research has taken a typological approach when studying parenting, where parenting styles or parenting behaviors are typed and examined for their associations with various child outcomes. Baumrind's (1967) research on four important dimensions of parenting and her introduction of three types of parenting styles have been influential on this typological tradition. Using observation, parental interviews and other research methods on more than 100 preschool-age children, Baumrind (1967) identified four important dimensions of parenting, including, disciplinary strategies, warmth and nurturance, communication styles, and expectations of maturity and control. Based on these dimensions, Baumrind later suggested that the majority of parents display one of three different parenting styles--authoritarian parenting, authoritative parenting, and permissive parenting (Baumrind, 1971, 1991).

However, based on the original typological approach, newer research has added of alternative options, suggesting the various components of parenting can be assessed separately (e.g., Lamborn, Mounts, Steinberg, & Dornbusch, 1991; Maccoby & Martin, 1983). For example, authoritative parenting is characterized as both responsive (warm, supportive) and demanding (regulating, controlling). Parents with this kind of parenting style are responsive to their children and willing to listen to questions. Authoritative parents monitor and impart clear rules for their children, and when children fail to meet the expectations, these parents are more nurturing and forgiving rather than punishing. In this case, it is difficult to understand authoritative parenting where the independent functioning of support and control dimensions are aggregated and functioning in a holistic manner (Wilson & Morgan, 2004).

A number of studies have confirmed the important roles parental support and control behaviors play in the development of adolescents (e.g., Lamborn & Felbab, 2003). Parental support usually refers to the level warmth that parents express towards their children, which has a well-established link in buffering adolescents from negative outcomes and acts as an indicator of positive adjustment in child development (e.g., Bean, Bush, McKenry, & Wilson, 2003). Comparing to parental support, parental control behaviors and its association with child outcomes is less consistent. Parental control behavior has been examined as an indication of positive parenting in some of the studies while as an aspect of negative parenting in others. (Peterson & Rollins, 1987). Because of the mixed findings and lack of conceptual clarity, researchers have referred to Schaefer's (1965) research and separated the dimension of control parenting into two specific forms—behavioral control and psychological control (e.g., Barber, 1996; Garber, Robinson, & Valentiner, 1997).

Parental behavioral control refers to the provision of rules, regulations, or structuring children's behavior. An examination of literature shows that parental behavioral control has been commonly examined in terms of parental monitoring (e.g., Pettit et al., 2001; Smetana & Daddis, 2002), which includes parents' awareness and supervision of their children's location, activities, and companions (Brown et al., 1993; Dishion et al., 1991; Patterson et al., 1992). Parental psychological control, on the other hand, refers to parent's attempts to interfere with children's development of independence and self-direction. Psychologically controlling parents tend to manipulate children's emotional and cognitive worlds through behaviors such as invalidating children's feelings and pressuring them to think in particular ways (Barber et al., 2002; Barber & Harmon, 2002). Normal development for adolescence requires sufficient "space" for the increased striving of autonomy, and the use of psychological control (e.g., parental intrusiveness,

love withdrawal, guilt induction) may hinder the development of psychological autonomy of the children and adolescents.

The distinction between behavioral control and psychological control, Barber, Olsen, and Shagle (1994) pertains to the objectives for what is being controlled in the child. Behavioral control is an attempt to regulate the child's behavior, whereas psychological control focuses on control over the child's psychological world (e.g., thoughts, feelings). It has been assumed that behavioral control is motivated by parents' attempts to socialize their children whereas psychological control develops from parents' need to protect their "psychological power" in the parent– child relationship (Barber & Harmon, 2002).

Both cross-sectional and longitudinal studies have shown findings that poorly monitored adolescents tend to be antisocial, delinquent, or criminal (e.g., Cernkovich & Giordano, 1987; Crouter, MacDermid, McHale, & Perry-Jenkins, 1990; McCord, 1986; Patterson & Stouthamer-Loeber, 1984; Sampson & Laub, 1994; Weintraub & Gold, 1991). Research has found that poor parental behavioral control may lead to use illegal substances, drugs, and engagement in risky sexual activity (Biglan, Duncan, Ary, & Smolkowski, 1995; Chassin, Pillow, Curran, Molina, & Barrera Jr, 1993; Flannery, Vazsonyi, Torquati, & Fridrich, 1994; Fletcher, Darling, Steinberg, & Dornbusch, 1995; Metzler, Noell, Biglan, Ary, & Smolkowski, 1994; Romer et al., 1994). Evidence also suggests that poorly monitored youth have more deviant friends (Dishion, Capaldi, Spracklen, & Li, 1995) and that they may become delinquent because of peer pressure (Fridrich & Flannery, 1995). Furthermore, research also suggested that lack of parental behavioral control was associated with children's poor performance in school (Crouter et al., 1990; White & Kaufman, 1997).

Parent psychological control, on the other hand, has been suggested to play an important role in children's emotional development, yielding negative effects such as childhood anxiety (Ballash, Leyfer, Buckley, & Woodruff-Borden, 2006; Rapee, 1997; Wood, McLeod, Sigman, Hwang, & Chu, 2003), depression (Barber, 1996; McCranie & Bass, 1984; Miller, Birnbaum, & Durbin, 1990; Soenens, Luyckx, Vansteenkiste, Duriez, et al., 2008; Soenens, Luyckx, Vansteenkiste, Luyten, et al., 2008), eating disorders (Soenens, Vansteenkiste, et al., 2008), and lower self-esteem (K. J. Conger et al., 1997; Garber et al., 1997; Silk, Morris, Kanaya, & Steinberg, 2003). In addition, literature suggests that psychological control is also a risk factor for externalizing problems (Galambos, Barker, & Almeida, 2003; Schaefer, 1965). Controlling parenting is linked to children's opposition (Bronstein 1994), emotional self-regulation problems (Fabes, Leonard, Kupanoff, & Martin, 2001) and antisocial behaviors (Barber, 1996; K. J. Conger et al., 1997; Herman, Dornbusch, Herron, & Herting, 1997; Joussemet et al., 2008; Prinzie, Van Der Sluis, De Haan, & Deković, 2010). These negative impacts of psychological control have been suggested to be due to the fact that this kind of parental control diminishes the child's own sense of control (Becker, Ginsburg, Domingues, & Tein, 2010; Nanda et al., 2012), instills a sense of dependence (Chorpita, Brown, & Barlow, 1998), and fosters the development of negative self-schemas (Barber, 1996; McLeod, Weisz, et al., 2007; McLeod, Wood, & Weisz, 2007).

To better understand the associations between parental controls and child outcomes, researchers have begun to explore possible mediating factors between these two constructs. Several studies have found some interesting mediators between psychological control behavior and child outcomes. Personalities such as perfectionism was found to mediate the association between parental psychological control and adolescent's self-esteem and depression (Soenens,

Luyckx, Vansteenkiste, Luyten, et al., 2008; Soenens, Vansteenkiste, et al., 2005). Emotional dysregulation was another mediator that was found to mediate the link between parental psychological control and adolescent emotional symptoms such as depression and anxiety (Brenning, Soenens, Braet, & Bosmans, 2012; McEwen & Flouri, 2009). Research by Mandara and Pikes (2008) has shown that the association between maternal psychological control and their depressive symptoms was mediated by adolescent's sense of control, but this mediation effect was only found for girls not for boys. Comparing to the study on mediator between psychological control and child outcomes, research on exploring the mediation factors between behavioral control and child outcomes is limited. One example would be the research of Li and colleagues. With a sample of Chinese adolescents, they has shown a partially mediating effect of self-control on the relationships between parental behavioral control and problematic internet use (Li, Li, Newman, 2013).

Self-Determination Theory

Self-determination theory (Deci & Ryan 1985, 2002) is a theory of human motivation and personality integration that proposes to examine the dynamics of self-regulation, motivation, and well-being within specific social contexts. Deci and Ryan (1985) argued that people are often moved by both external factors (e.g., rewards, grades, evaluations) and internal factors (e.g., interests, curiosity, care or abiding values). These two kinds of forces work in different contexts providing individuals with the energy and passion for creativity and sustainability efforts. Self-determination theory uses the concept of innate, universal, psychological needs to understand the interaction between the extrinsic forces acting on persons and the intrinsic motives and needs inherent in human nature (Deci & Ryan, 1985).

The central tenet of self-determination theory is its identification of three universal and basic human needs: autonomy, competency, and relatedness (Deci & Ryan, 2002). First, the need for autonomy implies people's desire of control and agency that entitle free choices and self-controlled behaviors. Second, the need of competency refers to one's feeling of competence and skillfulness in achieving goals when undertakes tasks and activities. Finally, the need of relatedness implies people's desire of being cared by, understood by, and affiliated with others. Self-determination theory focuses on these psychological needs, as it defines psychological needs as essential for human's psychological growth and well-being. Based on definition proposed by self-determination theory, satisfaction of the three basic needs will result in an individual's elaborated sense of self and achievement of a better psychological well-being. A growing body of research based on self-determination theory has provided evidence that the three basic needs play a significant role in people's health and well-being (e.g., Deci & Ryan, 2000; Ryan & Deci, 2009; Sheldon, Elliot, Kim, & Kasser, 2001).

Another central tenet of self-determination theory is its construct on human motivation, which also differentiates it from other needs theories (e.g., McClelland's theory of needs, 1969) as well as motivation theories (e.g., Bandura's social cognitive theory, 1977, 1989). Self-determination theory proposes that behaviors vary in the degree of autonomous versus controlled. Autonomous behaviors are usually caused by internal factors, which are performed volitionally and are conducted based on personal interest or from one's integrated sense of self (Deci & Ryan, 1991). While on the other hand, controlled behaviors are often caused by external factors, either because of pressure, demands or order (Ryan, 1982). In self-determination theory, individuals have an innate propensity for growth and based on the motivational forces (autonomy vs. controlled). It need to be noted that autonomy in self-determination theory is not with the

same as independence. Rather than a lack of reliance on others, autonomy in self-determination theory denotes free will in one's actions (Ryan & Deci, 2000). Given that individual's autonomy needs, environments and actions that hinder this need would harm individual's psychological wellbeing.

The examination of environmental factors, such as social, cultural or family context, is another highlight of self-determination theory. The theory suggests that the context can determine whether behaviors are regulated in relatively autonomous or controlled ways. Individuals who develop through social interactions that provide support for the three basic needs for autonomy, competence, and relatedness are more likely to be self-determined, conduct self-regulative behaviors, and achieve enhanced psychological well-being. While if external pressure or control exists that goes against these basic needs, robust detrimental impacts will be seen on the development of individuals. Since all human beings have the fundamental needs to feel autonomous, competent, and related in order to develop and function optimally (Deci & Ryan, 2000), how social, cultural or family factors enhance or diminish people's sense of volition, social functioning, and personal well-being is an area worth deeper investigation. With the guidance of self-determination theory, studies have been conducted within the context of families, classrooms, organizations, and cultures (Deci & Ryan, 2000).

Under the family context, the two forms of parental control (parental psychological control and parental behavioral control) play important roles in determining how and whether children's basic needs will be met. Regarding autonomy needs, self-determination theory hypothesized that the need to experience behaviors free of control is inherited in human nature. Parental psychological control, which refers to the use of intrusiveness, guilt induction or love withdrawal (Barber 1996; Schaefer 1965), attempts to interfere with children's development of

self and manipulate children's emotional and cognitive worlds. This form of parental control undermines children's basic need of autonomy, thus leads to a higher possibility of feeling distressed. Studies have suggested that parental control is linked to worse emotional well-being and poorer social relationship (Barber et al., 2005; Grolnick & Ryan, 1989; Wang, Pomerantz, & Chen, 2007).

Regarding competent needs, self-determination theory proposed that individual's need of knowing how they perform. Children are more likely to feel competent in an environment where clear guidelines and rules are set and predictable outcomes for their behavior can be expected. In contrast, children who develop in unpredictable environments are less likely to feel competent. Parental behavioral control, which refers to parent's attempts to provision of rules, regulations or structures on children's behavior (Barber 1996; Schaefer 1965) fits perfectly in meeting children's competent needs. Literature has shown that clear structure provided by parents at home is related to higher levels of social and behavioral competence and academic performance (Farkas & Grolnick, 2010; Grolnick & Ryan, 1989; Wang et al., 2007).

Regarding relatedness needs, self-determination theory postulates that individuals' desire of being cared by, understood by, and affiliated with others. Controversy results may be found for meeting this need due to the conflation of the two forms of parental control behaviors described above: parental psychological control provides affiliation, but in a way that the children's may not feel being cared and understood because of the limitation in autonomy; parental behavioral control, on the other hand, provides care and understanding, but the affiliation may not be as much as those psychological control parents provided.

The Current Study

The purpose of this study is to examine how parental psychological control and parental behavioral control contributes to the child's internalizing and externalizing behaviors.

Furthermore, the current study examines whether three basic psychological needs (autonomy, competence, and relatedness proposed in self-determination theory) mediate the relation between two forms of parental control and children outcomes.

Associations between parental control and child outcomes (both internalized and externalized) have been established by existing literature (e.g., Barber et al., 1994). However, the pathways between parental control behaviors and child outcomes have not been thoroughly investigated. More research is needed to replicate the empirical associations between parental control behaviors and child problem behaviors, as well as to identify the specific mechanisms that underlie these associations (mechanisms). Existing literature has also highlighted the considerable variation in the two forms of parental controls (Barber et al., 1994). For example, psychological control may be positively associated with child outcomes while behavioral control may be negatively associated, which may contribute to a possible underestimation of the association between two forms of parental controls if broadly defined. If that is true, the true association would be stronger than the overall association. In addition, although it has been hypothesized that autonomy may mediate the association between parental control behaviors and child adjustment outcomes, very few studies have empirically investigate this association (see Marbell & Grolnick, 2013; Schiffrin et al., 2014 for exception). Furthermore, none of the studies has investigated the mediating roles of all three needs that self-determination theory proposed (autonomy, competence and relatedness), nor have them examined both forms of parental control (psychological control and behavioral control) at the same time.

The proposed theoretical model to be tested is illustrated in Figure 1. First, there would be a significant positive association between parental psychological control and child internalizing behavior as well as externalizing behavior. Second, the relation between parental psychological control and child internalizing behavior would be mediated by autonomy, competency, and relatedness, such that greater levels of parental psychological control would be associated with lower levels of autonomy, which would be associated with less child internalizing behavior and less externalizing behavior; greater levels of parental psychological control would be associated with lower levels of competence, which would be associated with less child internalizing behavior and less externalizing behavior; greater levels of parental psychological control would be associated with higher levels of relatedness, which would be associated with less child internalizing behavior and less externalizing behavior.

[Insert Figure 1 here]

Third, it is hypothesized that there would be a significant negative association between parental behavioral control and child internalizing behavior as well as externalizing behavior. Forth, the relation between parental behavioral control and child internalizing behavior would be mediated by autonomy, competency, and relatedness, such that greater levels of parental behavioral control would be associated with lower levels of autonomy, which would be associated with less child internalizing behavior and less externalizing behavior; greater levels of parental behavioral control would be associated with higher levels of competence, which would be associated with less child internalizing behavior and less externalizing behavior; greater levels of parental behavioral control would be associated with higher levels of relatedness, which would be associated with less child internalizing behavior and less externalizing behavior. To

have a better observation on mediation effect of each meeting each needs, three separate models have been tested.

Method

Participants and Procedure

The participants for this study were selected the Flourishing Families Project (FFP). The FFP is a longitudinal study that involves families with a teenage child ages from 10 to 14 at Wave 1 of the study in 2007. Families were recruited from a large Northwestern city with a purchased national telephone survey database. Among the 692 eligible families contacted, 423 of them agreed to participate. However, the national database was generated using telephone, magazine, and Internet subscription reports. As a result, families of lower SES were underrepresented. To better represent the demographics of the local area, 77 families were recruited into the study through methods such as referral and fliers, resulting in 500 total families participating at Wave 1. After the consent forms were acquired, trained interviewers visited the participant families administered assessment that consisted of a 1-hr video and a 1.5-hr self-administered questionnaire. Families in the project were give a stipend of 100 dollar per person for their participation.

At Wave 1 in 2007, 67.0 % ($n = 335$) of the families were two-parent families while 33.0 % ($n = 165$) were single-parent families. About half (47.6 %) of the children were male in these families, and the average age for all children in the sample is 11.29 years ($SD = 1.01$). These families were interviewed at yearly intervals for Wave 2 (2008), Wave 3 (2009), Wave 4 (2010), and Wave 5 (2011). The project consisted of 500 families at Wave 1, with a 96% retention rate at Wave 2 ($N = 480$), 91.8% at Wave 3 ($N = 459$), 93.8% retention rate at Wave 4 ($N = 469$), and 92.6% retention rate at Wave 5 ($N = 463$).

The sample utilized in the current study was drawn from the FFP study's Wave 3 (2009), Wave 4 (2010), and Wave 5 (2011) data collection. At Wave 3, 449 mother–child dyads with a child between the ages of 11 and 15 at Time 3 were selected (Mean age of child = 13.30, SD = 1, 52% female). The sample was selected from the larger sample based on whether mother is the first and primary caregiver in the family. Regarding ethnicity, 66% of the participants were European American, 12.5% were African American, and 20% indicated that they were multi-ethnic. The average age of mom is 45.08 years (SD = 6.55; range 29–76 years). Seventeen percent of families reported an combined income less than \$40,000 per year, 53% made between \$40,000 and \$100,000 a year, and 30% made more than \$100,000 per year, with 56% of mothers reporting working now and 15% full-time homemaker. In terms of education, 60% of mothers reported having a bachelor's degree or higher.

Measures

Parental Psychological Control

The use of psychological control was assessed with the Psychological Control Scale–Youth Self Report (Barber 1996) at Wave 3 (2009). Respondents answered how true items were for each parent. Sample items included “My parent tries to change how I feel or think about things” and “My parent will avoid looking at me when I have disappointed her/him.” Responses ranged from 1 (never) to 5 (very often) with higher scores indicating a greater degree of parental psychological control. The original Cronbach's alpha reliability coefficients for this measure were found to be .83 for mothers and fathers (Barber 1996). In the current sample, the Cronbach's alpha coefficients were .85 for adolescents' responses about their mothers' psychological control.

Parental Behavioral Control

Prenatal attempts to monitor child's behavior and child's willingness to share information with parents were assessed using a modified 12-item measure of parental monitoring behaviors (Kerr and Stattin 2000) at Wave 3 (2009). The modified measure included items from parental knowledge, child disclosure, and parental solicitation subscales. All these subscales were used to create a latent variable for parents' behavioral control behaviors. Children answered how often each item occurred in relation to each parent. Responses were based on a 5-point Likert scale ranging from 1 (never) to 5 (always). Higher scores on items 1-4 indicate more knowledge about the child and his/her behavior, higher scores on items 6-8 indicate more disclosure by the child, and higher scores on items 9-12 indicate higher levels of parent solicitation. Example questions for Parental Knowledge included "When I am not at home, my parent knows where I am" and "My parent knows who my friends are." Example questions for Parental Disclosure included "I tell my parent about my day at school" and "I tell my parent what I have done with friends when I get home". Example questions for Parental Solicitation included "My parent talks with my friends when they come to our house" and "My parent start conversations with me about things that happen at school." Kerr and Stattin (2000) found the reliability to be .82 (knowledge), .80 (disclosure), and .69 (solicitation). In the current sample, Cronbach's alpha coefficients were found to be .75 (knowledge), .74 (disclosure), and .77 (solicitation) for adolescents' perceptions of parental behavioral control for their mothers.

Child Internalizing Behavior

Internalizing behavior problems were measured using a 13-item depression and anxiety-related items (Barber, Stolz, Olsen, & Maughn, 2005). Sample items included: "I am unhappy, sad or depressed" and "I feel worthless or inferior." Responses ranged from 0 (not true) to 2

(very true or often true) with higher scores indicate higher levels of internalizing problem behaviors. Cronbach's alpha coefficients were found to be .86 for the current sample. A latent variable was created for internalizing behavior measures using parcel scores from child reports.

Child Externalizing Behavior

Externalizing behaviors were measured using a 9-item measure of externalizing problem behavior at Wave 5 (Barber, Stolz, Olsen, & Maughn, 2005). Adolescents responded to nine-items, with sample items that include "I lie or cheat" and "I steal things from places other than home." Responses ranged from 0 (not true) to 2 (very true or often true) with higher scores representing higher levels of externalizing behaviors. Cronbach's alpha coefficients were found to be .80 for the current sample. A latent variable was created for externalizing behavior measures using parcel scores from child reports.

Autonomy

Autonomy of the respondents were measure using their report of self-regulation. Child's ability to regulate negative emotions and disruptive behavior, and to set and attain goals was assessed using a modified 13-item measure (Novak & Clayton, 2001). Responses ranged from 1 (never true) to 4 (always true). Sample items included: "I have a hard time controlling my temper" and "I get distracted by little things." Higher scores represent greater ability to regulate negative emotion/behavior and to reach goals. Novak and Clayton (2001) found reliability coefficients to be .95 (emotional subscale), .96 (cognitive subscale), and .94 (behavioral subscale). Cronbach's alpha coefficients were found to be .81 (emotional subscale), .79 (cognitive subscale), and .84 (behavioral subscale).

Competency

Adolescents' competency was assessed with their self-esteem using the Rosenberg Self-Esteem Scale (Rosenberg, 1965). Child reports on their global feelings of self-worth, their qualities, and how they compare to peers. Adolescents responded to 10 items on a 5-point Likert-type scale ranging from 1 (strongly agree) to 5 (strongly disagree). Sample items include, "I certainly feel useless at times" and "on the whole, I am satisfied with myself." Negative items were reverse coded with higher scores representing higher self-esteem. For current study, Cronbach's alpha coefficient is .89.

Relatedness

Parent-child social relatedness were used to measure relatedness. The degree to which the child feels socially connected to each parent was assessed using six items adapted from a general social relatedness measure (Lee, Draper, & Lee, 2001). The original measure consists of 18 items from the Social Connectedness Scale-Revised, a measure of general social connectedness. This one has been reduced to 6 for the purpose of reducing questionnaire length. In addition, some significant changes have been made to questions to adjust for reading level and to make them relevant to the parent-child relationship. Note: a key difference between the parent and child versions of this measure was found in the response categories. The adult version uses a 6-point scale ranging from 1 (disagree) to 6 (agree), whereas the child version has a 5-point scale ranging from 1 (strongly disagree) to 5 (strongly agree), with higher scores indicating a greater degree of parent-child social connectedness. In addition, the child version has 6 items, while the adult version has 9 items. Children answered the set of questions once for each parent. Sample items included: "even though I am very close to my parent, I feel I can be myself" and "I am comfortable with some degree of conflict with my parent." Cronbach's alpha coefficient for this

measure was previously was found to be .78 (Lee, Draper & Lee, 2001), while Cronbach's alpha coefficient was found to be .77.

Control variables

Literature on parental behavioral control and psychological control is inconsistent with their findings on the impact of child or adolescent gender on their developmental outcomes. Some studies finding no gender differences (e.g., Herman, Dornbusch, Herron, & Herting, 1997) whereas others reporting model of girls showed stronger associations than models of boys (e.g., Conger, Conger, & Scaramella, 1997). As a result, the current study included gender from wave one of the data set as a control. In addition, age of adolescent in wave three, and ethnicity of adolescent in wave one were also included. In the structural equation model, paths were created between these variables and all endogenous variables in the model.

Analytic Plan

Data analyses were conducted using IBM SPSS Statistics 23 and structural equation modeling was conducted using Mplus 7 (Muthén & Muthén, 2007). Structural equation modeling analyses were conducted to test the theoretical model shown in Figure 1. Using SEM is beneficial because it allows us to test our theoretical model with minimized bias and errors in estimates. Representative constructs were created through latent variables in the model, which are free of random errors (Markus, 2012). Child's gender, age, and race were treated as control variables. Thus, they will be included in the model as predictors of all the other variables. The testing and refining of theoretical models involved several sequential steps as illustrated in the following sections.

Treatment of Missing Data

Little's missing completely at random (MCAR) test (Little, 1988) was performed in SPSS 23, the null hypothesis "data were missing completely at random" was hold for autonomy need model with $\chi^2(45) = 57.870$, $p\text{-value} = .094$. But, MCAR test for competency need and relatedness need model was significant, where $\chi^2(45) = 65.083$, $p\text{-value} = .027$, and $\chi^2(45) = 63.846$, $p\text{-value} = .034$ respectively. Although Full Information Maximum Likelihood (FIML) requires that missing values to be at least MAR, there is good evidence suggesting that using modern missing data estimation approach such as FIML may be reasonable provided correlates of missingness are included in the model (Graham, 2003). Thus, all missing values in the models were estimated in Mplus using the FIML method.

Creating Latent Variables

Latent variables will be created for autonomy, competency, relatedness, parental behavioral control, parental psychological control, child internalizing behavior and child externalizing behavior. For parental behavioral control, the latent variable will be constructed with subscales from the measures as indicators. For the other variables, three parcels were formed for each measure as indicators to construct latent variables. To create the parcels, exploratory factor analysis will be used in SPSS 21, all items in the measure will be forced to load on one factor, and then items were ranked from the highest loading to the lowest. Then item will be selected for each of the three indicators so that the average item-total correlation for items within each measured indicator was similar as was the number of items assigned for each indicator. That is, items will be assigned a number one to number three based on their loading ranking with all the ones assigned to indicator 1, all the twos assigned to indicator 2 and all the

threes to indicator 3. The mean score of items within each indicator will be used as a summary score of that indicator.

Testing the Measurement and Hypothesized Models

The first step in testing the model is to evaluate the measurement model as shown in Figure 2. The analyses will be conducted based on the covariance among the variables. The overall fit of the model will be obtained. All seven variables in the model (parental psychological control, parental behavioral control, autonomy, competency, relatedness, internalizing behavior, externalizing behavior) will be specified as latent variables. After testing the measurement model, the next step is to test the hypothesized model and indirect effects. Bias-corrected bootstrap sampling procedure (Shrout & Bolger, 2002) will be used to test the significance of the mediation hypotheses, which provides a more accurate confidence intervals of indirect effect than Baron and Kenny's (1986) procedure and the Sobel's normal theory (Sobel, 1982), because of its justification of shift on the data. Shrout and Bolger (2002) observed that the product of two normally distributed variables are skewed, with the direction of the skew depending upon whether the relationships are positive or negative between the two normally distributed variables. As a consequence, confidence intervals surrounding point estimates of an indirect effect as a product of the two coefficients tend to be asymmetric. Shrout and Bolger (2002) demonstrated that the confidence interval derived from a skewed sampling distribution tends to be too wide in the direction of the null hypothesis and too narrow in the direction of the alternative hypothesis. As a result, a bootstrap procedure is recommended for obtaining bias-corrected confidence intervals for indirect effects (for more detail, see Mallinckrodt, Abraham, Wei, & Russell, 2006).

Results

Characteristics of the Sample

Participant children averaged 14.3 years of age ($SD = 1$), while the mean age for the mothers was 46.08 years ($SD = 6.55$). The average monthly income was \$5,742 ($SD = \$4,990$). The large standard deviations for income reflect the deliberate sampling of participants from low, moderate, and high-income neighborhoods. Among the 449 families, 228 has female child and 210 has male child with 11 families didn't report the gender of their children. Three hundred and thirty-nine families were of European American ethnicity, 62 were African American, with smaller number for Hispanics (12) and Asian Americans (16). Thirteen families are categorized as multi-ethnic, based on a combination of two or more ethnicities among family members and 7 chose others.

Conceptual Model

As shown in Figure 1, the purpose of this study is to test the mediation effect of three basic needs of children between parental control behavior and child outcomes based on self-determination theory.

Table 1 shows the loadings of the measured variables on the latent variables were all highly significant. The correlations among the latent variables included in the model are presented in Table 2, where relationships among these variables were generally consistent with expectations. For example, parental psychological control correlated positively with child externalizing behavior, parental behavioral control correlated positively with child internalizing behavior. Unexpected findings included a statistically significant positive relationship between the parental psychological control and child internalizing behavior.

Baseline Model between Parental Control Behavior and Child Outcomes

As shown in Figure 2, an adequate fit to the data was observed in the baseline model, chi-square $\chi^2(48, N = 426) = 79.061$ with $p < .001$, root-mean-square error of approximation (RMSEA) = 0.039 and comparative fit index (CFI) = 0.986. Positive direct effects from parental psychological control to child internalizing behavior ($\beta = .21, p < .001$) and externalizing behavior ($\beta = .12, p < .05$) were shown, while only the association between parental behavioral control and child externalizing behavior ($\beta = -.33, p < .001$) was shown as statistically significant, leaving the association between parental behavioral control and child internalizing behavior not statistically significant.

[Insert Figure 2 here]

Child Autonomy Model

When adding child autonomy needs to the baseline model, an overall fit of the data provided an adequate fit to the data, $\chi^2(80, N = 429) = 176.179$ with $p < .001$, RMSEA = 0.053 and CFI = 0.96. Standardized coefficients for the paths included in the model are shown in Figure 3. Statistically significant effects were observed from parental behavioral control to child externalizing behavior ($\beta = -.27, p < .001$). The associations from parental behavioral control to child externalizing behavior and internalizing behavior were no longer significant. Together, parental psychological control ($\beta = -.27, p < .001$) and behavioral control ($\beta = .11, p < .001$) accounted for 10% of the variation in child autonomy. At the meantime, child internalizing behavior ($\beta = -.57, p < .001$) and externalizing behavior ($\beta = -.50, p < .001$) were found negatively associated with child autonomy needs.

[Insert Figure 3 here]

Mediation relationships between parental control and child outcome are also specified in the model shown in Figure 3. The statistical significance of these hypothesized indirect effects on child outcomes through child autonomy needs were tested with the bias-corrected bootstrap sampling procedure that is available in the Mplus through bootstrapping analysis. Results showed that two of the four expected indirect effects of parental control variables on child outcomes were statistically significant. The indirect effect of parental psychological control on child internalizing behavior through child autonomy was significant ($\beta = 0.152$, 95% CI = [0.028, 0.276]); and the indirect effect of parental psychological control on child externalizing behavior through child competency was also significant ($\beta = 0.132$, 95% CI = [0.021, 0.243]). Since both of the 95% confidence intervals excludes zero, the two indirect effects were statistically significant. One thing need to be noticed is that the edge of the confidence intervals were close to zero, which might raise caution when explaining the significant result.

Child Competency Model

Testing the mediation effects of child competency needs based on the baseline model, results indicated that the hypothesized model provided an adequate fit to the data, $\chi^2(80, N = 429) = 132.602$ with $p < .001$, RMSEA = 0.039 and CFI = 0.983. Standardized coefficients for the paths included in the model are shown in Figure 4. Consistent with the baseline model, strong negative relationship was shown between parental behavioral control and child externalizing behavior ($\beta = -0.29$, $p < .001$). In combination, parental psychological control and behavioral control accounted for 20% of the variation in child competency, where both parental behavioral control ($\beta = 0.21$, $p < .001$) and parental psychological control ($\beta = -.32$, $p < .001$) were significant predictors of child competency. Some unexpected results include parental behavioral control was positively associated with child internalizing behavior ($\beta = .19$, $p < .001$). Parental psychological

control was no longer associated with child internalizing behavior and externalizing behavior. Overall, parental psychological control, parental behavioral control and child competency accounted for 26% of the variation in child internalizing behavior and 17% of child externalizing behavior.

[Insert Figure 4 here]

Bootstrapping analysis for mediation showed that all four indirect effects of parental control variables on child outcomes through child competency needs were statistically significant. The indirect effect of parental psychological control on child internalizing behavior through child competency was significant ($\beta = 0.167$, 95% CI = [0.084, 0.249]); and the indirect effect of parental psychological control on child externalizing behavior through child competency was also significant ($\beta = 0.052$, 95% CI = [0.005, 0.099]); the indirect effect of parental behavioral control on child internalizing behavior through child competency was significant ($\beta = -0.112$, 95% CI = [-0.182, -0.043]); the indirect effect of parental behavioral control on child externalizing behavior through child competency was significant ($\beta = -0.035$, 95% CI = [-0.068, -0.002]). Since all of the 95% confidence intervals exclude zero, the four indirect effects were statistically significant. Again, we noticed that the edge of the confidence intervals were very close to zero.

Meanwhile, an interesting result was observed that the association between parental behavioral control and child internalizing behavior, which was not significant in the direct association model, was statistically significant ($\beta = .19$, $p < .001$). Such change indicated a suppression effect of competency needs of children between parental behavioral control and child internalizing behavior. This unexpected finding indicated a suppression effect that Davis

defined as inconsistent mediation model (Davis, 1985), where direct and mediated effects of parental behavioral control and child internalizing outcome have opposite signs.

Suppression effect can be spotted when a suppressor variable removes a mediation or confounding effect, which will result in an increase in the magnitude of the relationship between the independent and dependent variable, in our case, between parental behavioral control and child internalizing behavior. A suppressor variable is a variable which will increase the validity of another variable with its inclusion in the regression equation (Conger, 1974, Tzelgov & Henik, 1991). The concept of suppression can be often seen discussed in educational and psychological testing (Cohen & Cohen, 1983; Horst, 1941; Lord & Novick, 1968; Velicer, 1978). Specifically in the current model, the estimated association for the relationship between parental behavioral control and competency together with the estimated association and standard errors for the relationship between competency needs and child internalizing behavior yielded an indirect effect of -0.097. While the suppression effect increased the magnitude of the relationship between parental behavioral control and child internalizing behavior to 0.185, which is opposite in sign of the indirect effect and consistent with condition of suppression effect.

Child Relatedness Model

Adding child connected needs to the baseline model, the overall fit indices indicated a reasonable fit of the data, where $\chi^2(80, N = 429) = 133.414$ with $p < .001$, RMSEA = 0.039 and CFI = 0.980. As shown in Figure 5, the standardized path coefficient from the parental psychological control to child internalizing behavior was positive and significant ($\beta = 0.176, p < .01$), while the path from parental psychological control to child externalizing behavior became non-significant. On the other hand, direct effect of parental behavioral control on child externalizing behavior was negative and significant ($\beta = -0.301, p < .001$) and the standard

coefficient path to child internalizing behavior was positive and significant ($\beta = 0.151, p < .05$). Both parental psychological control and behavioral control were significant predictors of child relatedness, where psychological control was positively ($\beta = -0.214, p < .001$) associated while behavioral control was negatively associated ($\beta = 0.518, p < .001$) with child relatedness needs. Together, they accounted for 40% of the variation in child relatedness needs. Relatedness needs is negatively associated with child internalizing behavior ($\beta = -0.162$), but it is only marginally significant with a p -value of 0.49.

[Insert Figure 5 here]

To explore the mediation association, bootstrapping analysis was used to find the indirect associations from parental control behaviors to child outcomes. Result showed none of the indirect effects from parental control variables to child outcomes through child relatedness needs was statistically significant. It was a little surprise, but it might be explained by the marginal significance of the path from child relatedness needs to child internalizing behavior ($p = 0.049$).

Discussion

The main purposes of this study were to test Barber's model (1996) of parental control behavior using the current sample in a longitudinal setting, and to gain further insight into the underlying mechanisms between parental control behavior and child internalizing and externalizing behavior through the investigation of the mediation effect of child autonomy, competency and relatedness needs based on self-determination theory.

Findings showed some consistency with Barber's theory (1996) and other prior research (e.g., Sampson & Laub, 1994; Weintraub & Gold, 1991) but also provided new insights to the associations between parental control and child outcomes based on the current sample. Similarly, as shown in Barber's theory, psychological control was positively associated with internalizing

behaviors and behavioral control was negatively associated with externalizing behaviors of children. The more psychological control parents used, the more internalizing behaviors the child manifested, meanwhile, the more behavioral control parent use, the less externalizing behaviors the child manifested. Furthermore, as shown in Barber's model, psychological control and behavioral control showed negative association in the current study, which means parents that exerting high levels of psychological control have a tendency to have less supervision on the behaviors of their children. Intuitively, if parents get used to one kind of parenting behavior, they might overlook the other possible ways to regulate their children. This finding shows that parents may, to some extent, differentiate the conceptualization of control, and they did care either more on what their children feel or what their children do, but not both at the same time on a high level.

In addition to these consistent findings, some new associations found in the analysis provided very useful information for further investigation. To begin with, psychological control showed strong association with externalizing behaviors, which was not shown in Barber's original model. In addition, behavioral control, in current sample, no longer had a significant impact on child internalizing behavior as shown in Barber's model. It is possible that children nowadays who get more psychological control from their parents might choose to express the pressure through externalizing behavior problems rather than internalizing behaviors as they used to be. It is also possible that the original sample from the relatively small city in the Midwest is different from the current sample from a large city in the Pacific Northwest.

Also, different from Barber's theory, comparing to the negative association, behavioral control positively predicted internalizing behaviors. Although the association was not statistically significant, it is possible that a quadratic association exists between the two

constructs. Behavioral control is helpful in reducing internalizing behaviors, but after reach a certain point, too much behavioral control may have the same effect of psychological control on child internalizing behaviors. Moreover, child internalizing behavior and externalizing behavior were positively associated, which shows these behavioral problems for youth usually come hand in hand.

The introduction of the three basic needs from self-determination to Barber's model may provide useful insight for better understanding the association between parental control behavior and child outcomes. To begin with, I investigated how autonomy needs help us better understand the associations. Significant indirect effects were shown between parental psychological control and child internalizing behavior through child autonomy. That is, higher psychological control would meet less autonomy needs of the children, which in turn, would result in more internalizing behavior. Meanwhile, significant indirect effects were also shown between parental psychological control and child externalizing behavior through child autonomy. Specifically, more psychological control will meet less autonomy needs of the children. Children with lower autonomy needs met by their parents would have more externalizing behavior problems. Ryan and Deci (2000) indicated that environments that thwart the autonomous need would undermine psychological wellbeing. Under both circumstances in our findings, psychological control limited autonomy needs of the children, and this limitation on the autonomous needs would lead to both internalizing and externalizing behavioral problems.

The investigation on competency needs showed that psychological control had a significant indirect positive effect on internalizing behaviors through child competency while behavioral control showed a significant indirect negative effect on internalizing behaviors and no indirect effect was found on externalizing behaviors. These findings help us better understand

how parental controls work on child outcomes. Psychological control may have negative impact on children's confidence on themselves, which in turn led to less communication with other people or less social interactions in general. On the other hand, behavioral control provides regulations that help children to be successful, which may help build children's confidence about themselves and in turn reduce internalizing behaviors.

A test on the indirect effect of connected needs shown no significant results. This suggested that even though the psychological control and behavioral control had high impact on meeting connected needs of the children, the results of meeting connected needs will not have significant impact on their behaviors. Because of the nature of this needs, it might have a larger impact on the relationship between parents and children comparing to child behavioral problems.

Despite its contributions, the study is not without limitations. The first limitation is that the study was based on a non-representative sample consisted mainly white families from urban area in a large west-coast city. The families were overall well-educated and have a relatively stable and high income. Had the sample included families from rural areas, the results may have looked different. Also, including families with lower education and lower income may provide a better representation of the population in the US.

Another limitation was that the measures were different from the original studies. Although previous findings from other studies were mentioned, and the validity and reliability of the measures I was using were high, variances might be introduced through the different measures used in the studies, especially for children's self-determination needs. To avoid this limitation from second hand data, future studies could start a longitudinal study with measures and sample that are more consistent with the earlier research to get a better comparison and

understanding of current findings. Meanwhile, although the measures are different, we still found the proposed association from the original model, which shows the generalizability of the theory.

Nevertheless, by revisiting the association between parental control behaviors and child developmental outcomes, this study provides helpful information between the effects of parental control behaviors on child development in an urban sample. By introducing the three basic needs of the children, the results also provide useful insights for a better understanding regarding the complicated mechanism between the associations.

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Tables

Table 1. *Loadings of Measured Variables on the Latent Variables*

Variable	Parental Psychological Control (PPC)	Parental Behavioral Control (PBC)	Child Autonomy (AUTO)	Child Competency (COMP)	Child Relatedness (CONN)	Child Internalizing Behavior (INTB)	Child Externalizing Behavior (EXTB)
PPC Parcel 1	.828						
PPC Parcel 2	.812						
PPC Parcel 3	.798						
Parental Knowledge		.732					
Child Disclosure Parental		.867					
Solicitation		.705					
AUTO Parcel 1			.611				
AUTO Parcel 2			.374				
AUTO Parcel 3			.462				
COMP Parcel 1				.824			
COMP Parcel 2				.898			
COMP Parcel 3				.885			
CONN Parcel 1					.725		
CONN Parcel 2					.720		
CONN Parcel 3					.783		
INTB Parcel 1						.795	
INTB Parcel 2						.869	
INTB Parcel 3						.844	
EXTB Parcel 1							.755
EXTB Parcel 2							.818
EXTB Parcel 3							.719

Note. The standardized loadings of the measured variables on the latent variables are shown.

Table 2. Correlations among the Latent Variables

Variable	1	2	3	4	5
Autonomy Model					
1. Parental Psychological Control	--				
2. Parental Behavioral Control	-.379***	--			
3. Child Autonomy	-.306***	.014*	--		
4. Child Internalizing Behavior	.184**	-.011	-.563***	--	
5. Child Externalizing Behavior	.248***	-.372***	-.551***	.330***	--
Competency Model					
1. Parental Psychological Control	--				
2. Parental Behavioral Control	-.379**	--			
3. Child Competency	-.396**	.332***	--		
4. Child Internalizing Behavior	.184**	-.008	-.485***	--	
5. Child Externalizing Behavior	.247***	-.373***	-.290***	.331***	--
Relatedness Model					
1. Parental Psychological Control	--				
2. Parental Behavioral Control	-.378***	--			
3. Child Relatedness	-.410***	.599***	--		
4. Child Internalizing Behavior	.186**	-.013	-.144*	--	
5. Child Externalizing Behavior	.241***	-.366***	-.264***	.33***	--

* $p < .05$ ** $p < .01$ *** $p < .001$, two-tailed.
 Note: Correlation between Child Autonomy and Child Competency is 0.794***, correlation between Child Autonomy and Child Relatedness is 0.375***, correlation between Child Competency and Child Relatedness is 0.405***.

Figures

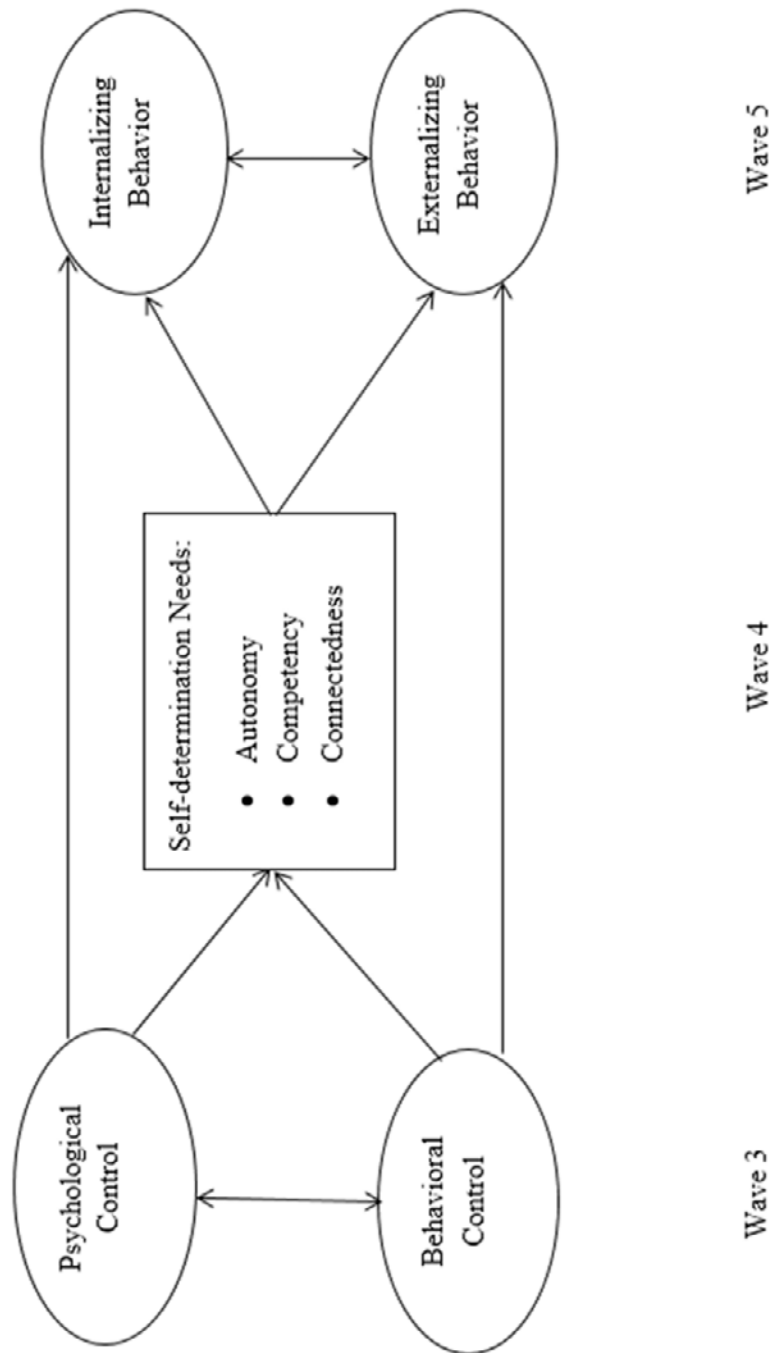


Figure 1 Conceptual Model

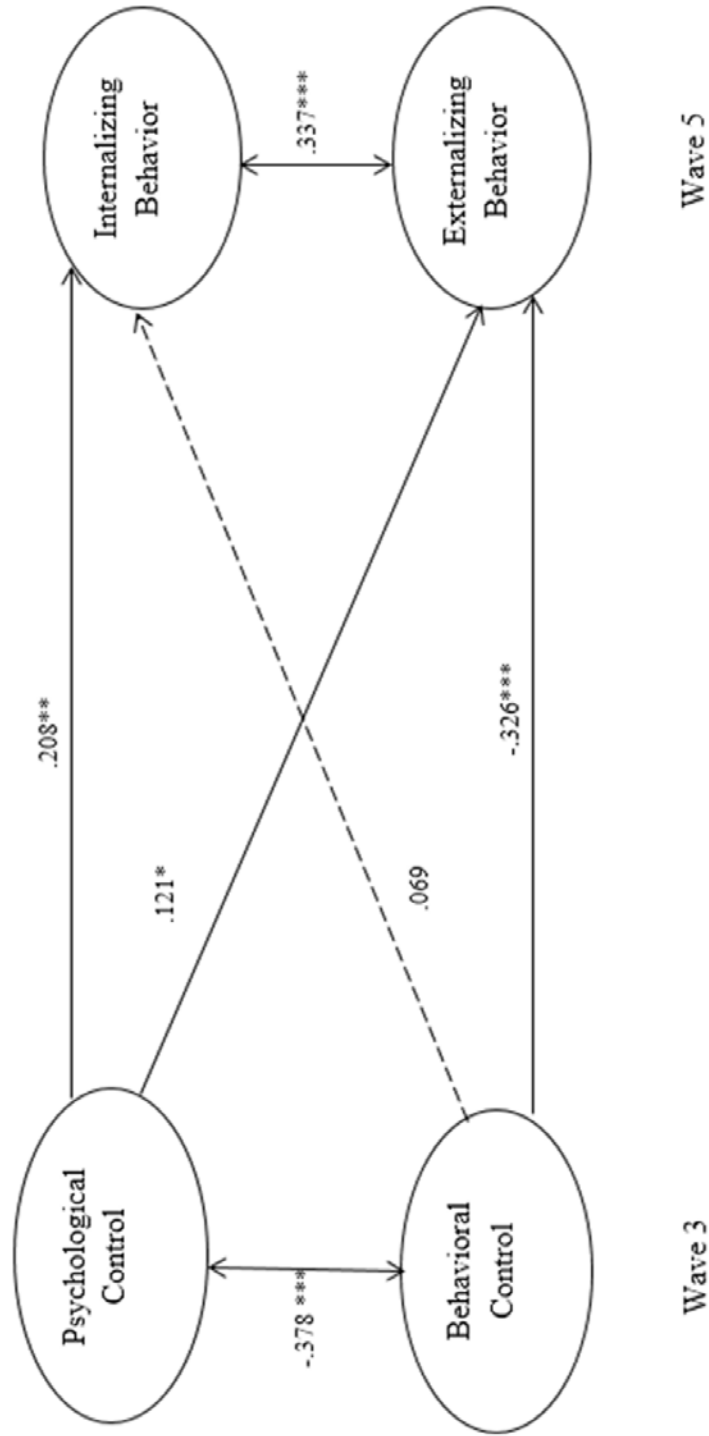


Figure 2 Baseline Model. Standardized estimations are presented. Solid lines indicate statistically significant paths, dashed lines show moderately significant paths.

$$\chi^2 = (48, N = 426) = 79.061 \quad p < .001; \text{RMSEA} = 0.039; \text{CFI} = 0.986 \quad \hat{p} < .10 \quad * p < .05 \quad ** p < .01 \quad *** p < .001$$

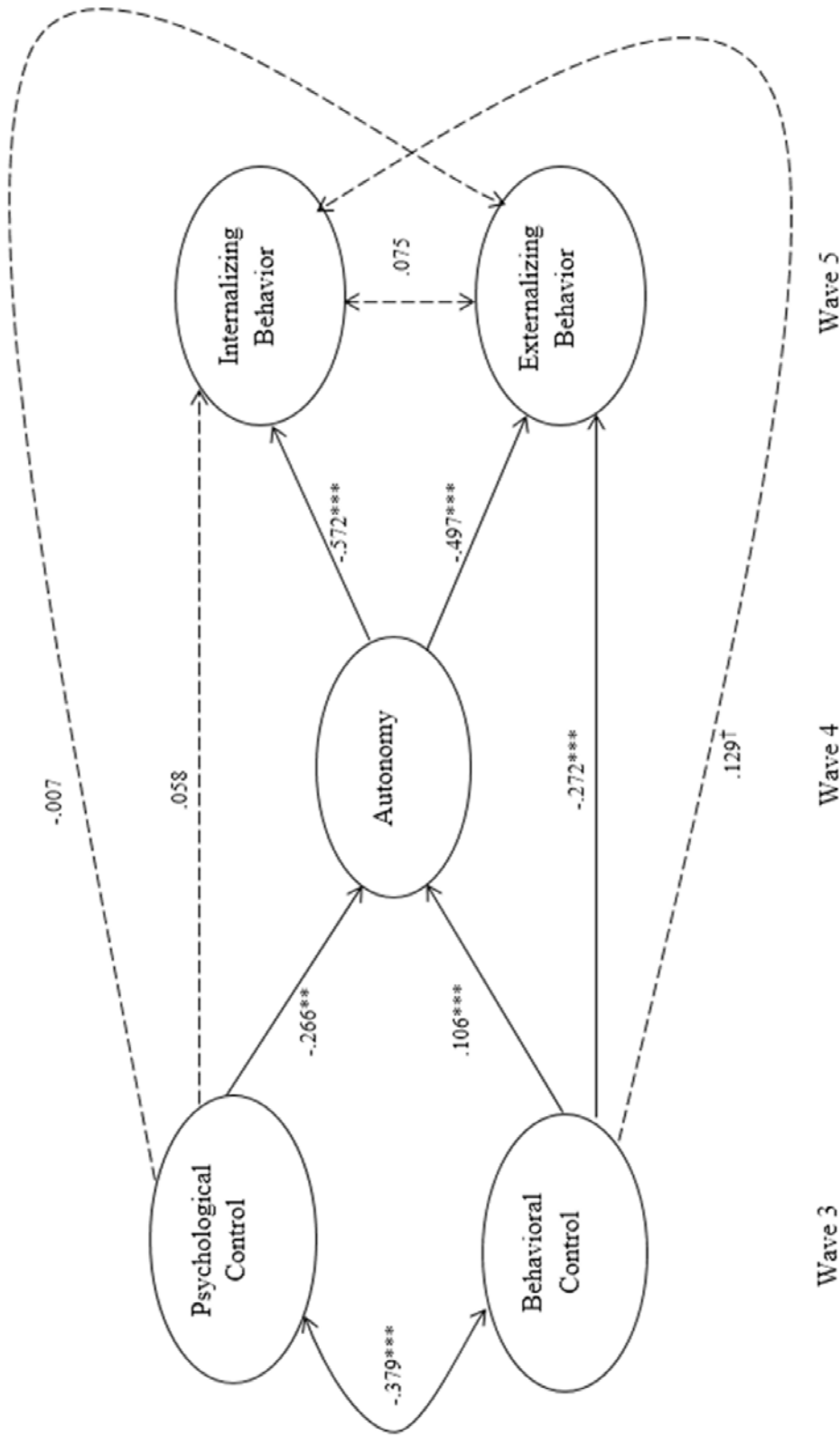


Figure 3 Child Autonomy Model. Standardized estimations are presented. Solid lines indicate statistically significant paths, dashed lines show moderately significant paths.

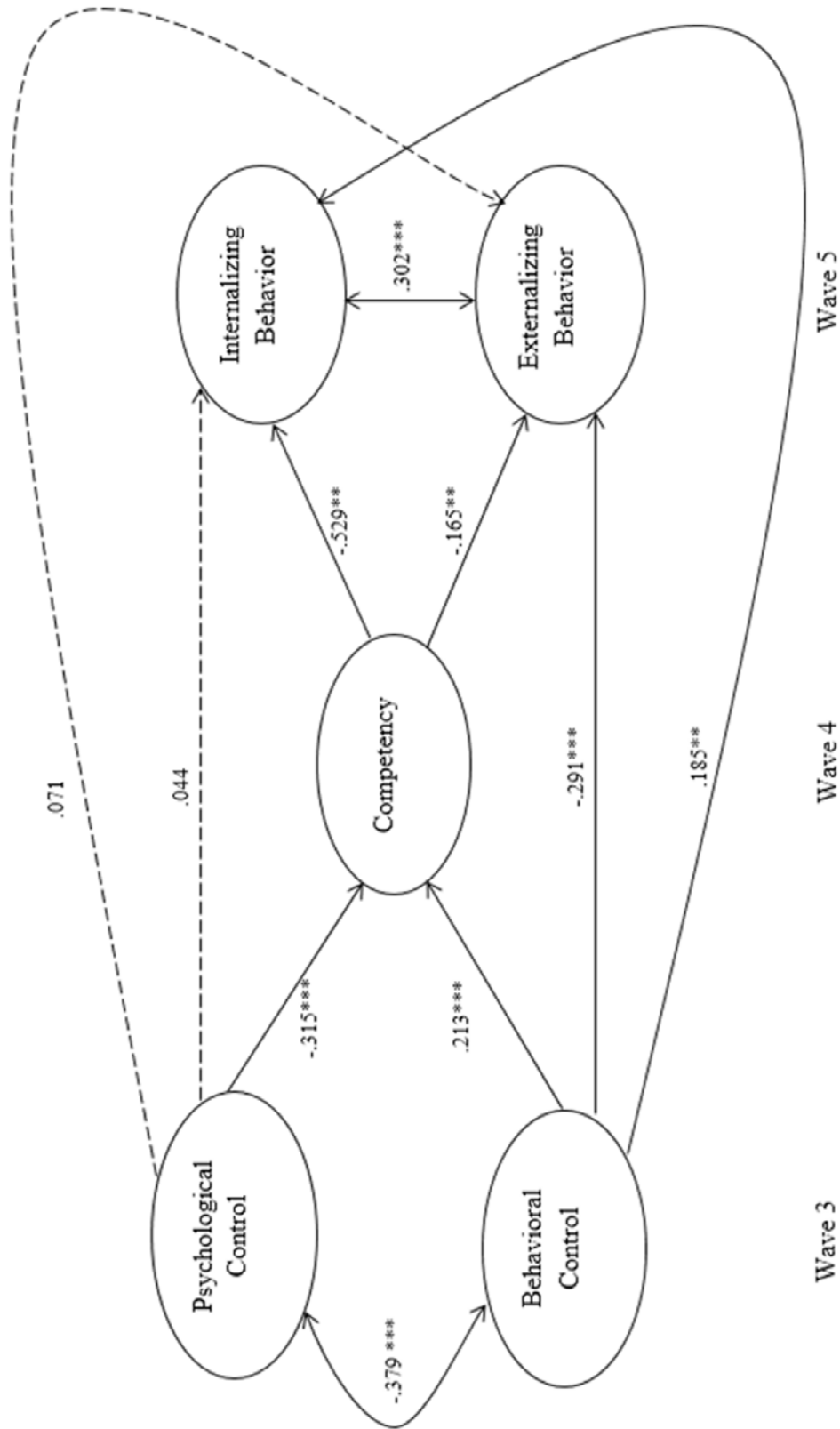


Figure 4 Child Competency Model. Standardized estimations are presented. Solid lines indicate statistically significant paths, dashed lines show moderately significant paths.

$\chi^2(80, N = 429) = 132.602, p < .001$; $RMSEA = 0.039$, $CFI = 0.983$, $p < .05$, $^{**}p < .01$, $^{***}p < .001$

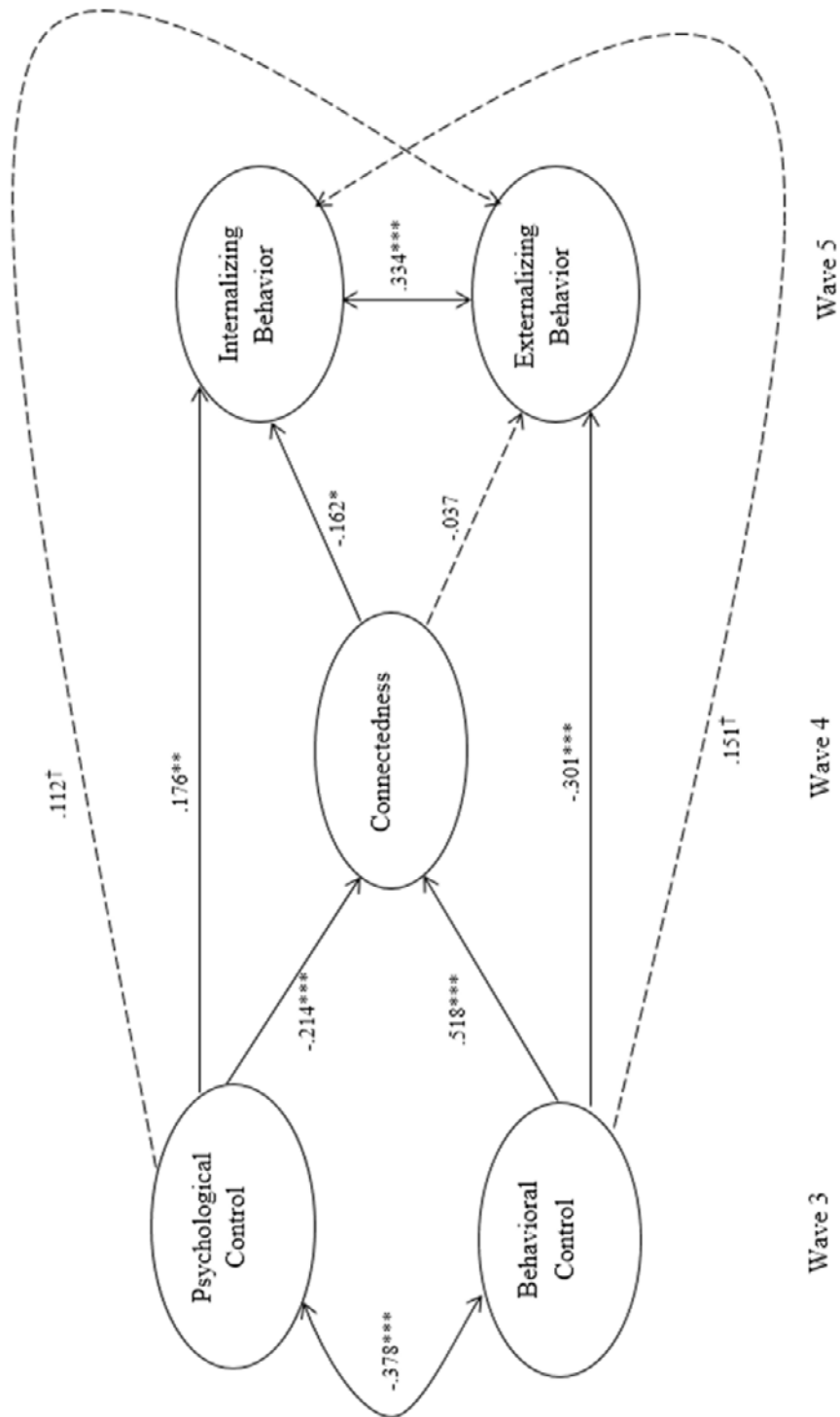


Figure 4 Child Relatedness Model. Standardized estimations are presented. Solid lines indicate statistically significant paths, dashed lines show moderately significant paths.

$\chi^2(80, N = 429) = 133.414$ $p < .001$; $RMSEA = 0.039$, $CFI = 0.980$ $\dagger p < .10$ $^{*}p < .05$ $^{**}p < .01$ $^{***}p < .001$

CHAPTER 4. DISCUSSION

Family Stress Model

The family stress model provided a structure for me to explore the effect of economic pressure on parenting behaviors, which, in turn, affected adolescent outcomes. Replacing the less nurturant/involved parenting behavior with parental control behaviors provided a new insight for how financial stress affects different types of parenting behavior. In the meantime, the inclusion of both psychological control and behavioral control into the model showed how economic pressure affects these two types of parental control behavior.

The family stress model hypothesizes a series of mediation effects that economic hardship leads to parents' feelings of economic pressure, and this pressure, in turn, creates feelings of distress, such as feelings of depression, anxiety, and anger, in both parents (R. D. Conger & Donnellan, 2007; Duncan & Magnuson, 2003). Similar results were found in the current study, where economic pressure associated with primary caregiver depressed mood, which in turn, was linked to marital conflict and then related to parental control. However, different from the family stress model, the current study found significant associations between economic pressures and marital conflict directly. It is possible that the exclusion of secondary caregiver may account for that difference, but it also might be the difference coming from the different sample, where the current sample might have more marital conflict that was directly influenced by economic pressure. In addition, the original study showed greater emotional distress affects parenting practices, both directly and indirectly through effects on inter-parental relationships, but no direct effect was shown in the current study when nurturant/involvement parenting was replaced by parental control behaviors.

Parental Control Behaviors

The two forms of parental control behaviors are the main focus of the current study. Psychological control refers to parental intrusiveness, love withdrawal, and guilt induction, where parents try to interfere with children's development of independence and self-direction by undermining their psychological development (Barber, 1996; Barber et al., 1994). This kind of control behavior usually inhibits the development of the individual. Psychological control have been found to be related to both internalizing problems such as depression (e.g., Soenens et al., 2012), anxiety (e.g., Nanda et al., 2012) and externalizing problems, such as aggression and anti-social behaviors (e.g., Nelson et al., 2013).

In the first study, psychological control is the only parental control behavior that was significantly associated with marital conflict. It shows how economic pressure affects the functioning of the family, which in turn, affect the psychological control behavior of the mothers. In the meantime, no significant association was found between parental psychological control and child externalizing behavior, but a significant effect was observed from psychological control to internalizing behaviors.

Although I didn't find significant associations to externalizing behavior, the association to internalizing behavior is very consistent to the earlier studies. One possible explanation for the non-significant result might be the use of child self-reported externalizing behavior, where adolescents might underreport delinquency behaviors. Also, the negative association between psychological control and behavioral control was significant, which shows parents might focus on one kind of controlling behavior while ignore the other one. However, since they are not opposite types of control on a unidimensional space, it is also possible for some parents to emphasize both kind of control at the same time.

Behavioral control, on the other hand, is a more facilitative parental control behavior. It refers to regulation, awareness of activities, and restrictions of behavior. Thus parental monitoring, usually defined as parents' awareness and supervision of their children's location, activities, and peers, became a fundamental component of effective behavioral control (Brown et al., 1993; Dishion et al., 1991; Patterson et al., 1992). Findings in the current study showed parental behavioral control was not associated to any construct from the family stress model. It might be because of the sample I have or because of the measure I used, but one explanation to this might be the fact that it does not matter whether there is high economic pressure or an intense relationship between the parents, supervision and regulation from the mother will always be there, especially for this early adolescent group in the current study. Change in the financial aspect of the family will not affect mothers' oversight on their children, it is part of their everyday routine. Findings showed negative association between parental behavioral control to child externalizing behaviors which is consistent with earlier studies where behavioral control has been linked to low levels of behavior problems (Barber, 1996; Barber et al., 1994; Pettit et al., 2001)

Both parental psychological control and parental behavioral control showed consistent links to the three basic needs proposed in self-determination theory. Psychological control was found to be negatively associated with needs, which shows more psychological control was bad for accommodating the need of the child. In contrast, behavioral control behaviors were found positively linked to needs. It seems supervision and regulation did help in meeting the need of the adolescence. Among all three kinds of need, competency has the highest negative association with psychological control, while the other two needs showed close magnitude on the relationship. On the other hand, relatedness has the highest positive association with behavioral

control, leaving the other two kinds of needs similar level of association. To me, it is understandable why these ranks hold. Psychological control intrudes on adolescent's thinking and feeling, which hinders their self-identification. Not recognizing their own identity may lead to less confident in doing things which may relate to lower competency need met. Meanwhile, the relatedness needs can be achieved through regulation and supervision, where regular checking and conversations showed the care and love from the mothers.

Self-Determination Theory

The three universal and basic human needs identified by self-determination theory (Deci & Ryan, 2002) provided me the theoretical support for a better understanding of how parental control behaviors work on child adjustments. Overall, the result shown in the current study were supported by the theory, however, differences were noticed in the complicated mechanism that is working behind the associations between parental control behavior and child outcomes. For the need of autonomy, which implies people's desire of control and agency that entitle free choices and self-controlled behaviors, was shown as a mediator for the association from psychological control to both child outcomes.

It also partially mediated the effect from behavioral control to externalizing behavior. The findings from need of competency is more complicated. Competency need refers to one's feeling of competence and skillfulness in achieving goals when undertakes tasks and activities. It had similar mediation effects for the association between psychological control and child adjustment, but for the association between behavioral control and child adjustment, it showed a suppression effect. This suppression effect helped us separate the mediation effect from the direct effect of parental behavioral control on child internalizing behavior, where the direct effect changed from non-significant to statistically significant after adding the need of competency.

From my understanding, the inclusion of competency raised observed r-square by accounting for the residuals. In another word, competency “suppresses” the error of the model without it which in turn strengthens the association between parental behavioral control and internalizing behavior. Finally, for the need of relatedness, which implies people’s desire of being cared by, understood by, and affiliated with others, the results showed it is only linked to internalizing behaviors but not externalizing behaviors. It appears that more connection between mother and child will help preventing emotional functions, such as depression and anxiety but for behavior problems such as aggression and delinquency, behavioral control has stronger impact comparing to everyday connection with the child.

It was fascinating to observe the different results among the three different needs. Since self-determination theory focuses on all of the three psychological needs, it seems they are equally important on the well-being of an individual. However, in the current study, different mechanism were shown under different need models. The findings provided evidence of differences in the levels of demand needed among the three basic needs, as well as in the way they worked in affecting child outcomes.

Adolescent Adjustment

Internalizing behavior problems can be characterized as anxiety, depression, and withdrawn behaviors (Bongers, Koot, Van der Ende, & Verhulst, 2003). Internalizing problems are subject to developmental trends. Research has shown that early internalizing problems have been found to predict internalizing problems as well functioning problems such as learning problems, academic performance, and social skills in later life (Mesman et al., 2001, Kovacs & Devlin, 1998). In the past few decades, the effect of psychological control on adolescents’ internalizing problems were widely studied. Findings have shown consistent positive association

between parental psychological control and adolescents' internalizing behaviors (pettit 2001, conger, 1997, barber 2005). Findings from study one showed economic pressure, primary caregiver depressed and marital conflict has no direct effect on internalizing behavior. The statistically positive association between parental psychological control and adolescents' internalizing behavior was confirmed once again in the current sample. Findings from the second study showed meeting the three basic needs proposed in self-determination theory will lead to less internalizing behaviors. This result is helpful for the parents to adjust their way of parenting. It might take longer for parents to change their parenting style, but if they understand how their parenting affect adolescents' behavior, they may be able to satisfy the needs of their children while gradually changing their parental control behavior.

Externalizing behaviors were usually categorized as delinquency behaviors such as aggression and anti-social behaviors that can be commonly found among young children. Studies have found externalizing behaviors to be associated with negative outcomes such as early substance use, bad performance at school or work, and interpersonal relationship difficulties (Champion, Goodall, & Rutter, 1995; McMahon et al., 2006; Offord & Bennett, 1994). Compared to internalizing behavior, more empirical attention has been devoted to examining bad consequences caused by externalizing behaviors (Burke, Loeber, & Birmaher, 2002; Frick, 2006; Loeber, Burke, Lahey, Winters, & Zera, 2000).

Externalizing behaviors were negatively associated with parental behavioral control in study one, which shows more regulation and supervision can help reduce adolescents' delinquency behaviors. Meanwhile, results also suggested child internalizing behavior is positively related with externalizing behavior. It is possible that once an adolescent get into one kind of trouble behavior, the other kind might follow. Which also raise another question about

whether there is any prediction relationship between interlining and externalizing behaviors. A panel study with more waves of data should be able to answer the question.

Findings from study two showed both psychological control and behavioral control have impact on externalizing behavior. More psychological control leads to more externalizing problems whereas more behavioral control leads to less externalizing behavior. The addition of three basic needs from self-determination theory showed meeting the needs were negatively associated with externalizing behavior. Again, it might be hard for parents to change their parenting behavior in a short period of time, especially when they are accustomed to certain kinds of parenting. This new information will not change their original parental control behavior but provide new guidance on providing better support to their adolescents to meet their basic needs. By doing so, I hope there would be less externalizing behaviors from the adolescents.

Limitations and future direction

There are several limitations to the current study I want to address. First is the limitation of the data set. The use of secondary data set saved me lots of time collecting my own data but brought problems such as sample representativeness, measurement of the construct and availability of measures. Specifically, the current sample only consisted of families from one location. Therefore, it only represent the local population but may not be generalizable to a larger population with a wider range of socioeconomic status and ethnicity background. Research has shown that parenting styles vary as a function of socioeconomic status (Hoff et al., 2002). As a result, it is possible that the use of psychological control behaviors and their correlates may differ in parents of children who experience higher level of economic pressures because of the lower socioeconomic status. That been said, the results of the current study provide an important empirical foundation from which future research can be conducted examining the associations

with a sample from lower socioeconomic status populations. Also, given the relative unstable economic situation throughout the world, findings from the present study may be relevant for a good portion of families in the United States that may be potential victims of the economic change. In addition, the participant lack ethnic diversity. Studies had suggested that what may be considered adaptive in one setting may be reversed in another because of the sociocultural context (e.g., Chao, 1994; Chao & Aque, 2009). Therefore, future studies are needed for replications of current findings in more ethnically diverse samples. Besides, the correlational nature in the first part of model, where the cross-sectional setting precludes prediction inferences between marital conflict and parental psychological behaviors is a notable limitation of the data. It is possible that associations between marital conflict and parental control behaviors were the other way around, that is, parental control behaviors cause marital conflict. Future work should test the model using longitudinal data set, where more clear casual effect between marital conflict and parental control behavior can be investigated.

Second, I wished to have better measures for the construct that I am interested in in the current model, such as the marital conflict and the negative child outcomes. Specifically, future study should replace the number of marital conflicts with a better measured construct that contains more dimensions of conflict. Also, inclusions of positive outcomes or specific outcomes that fit the future trend of child development concern are recommended. Possible examples of outcomes may include but not limited to child adjustment, obesity, Internet or gaming addiction, and even drinking behaviors. With all these possible positive and negative outcomes, research would not only provide refinement of the current study as well as the earlier theory, but also generate useful information for prevention and intervention efforts.

Finally, several future research directions should be noted. One direction is expand the current study by adding parental support to the current model. I have focused on parental control behavior in the current studies because my research interest, but it is also worthwhile to examine all three kind of main parental behaviors. By doing so, we will be able to get a better understanding about how they work together and how they affect adolescents' adjustments through the three basic needs of self-determination theory. Another direction is to test the same model but focus more on father's perspective. Through the analysis of fathers, we will see how the traditional bread winner will be affected in dual income families by the current economic pressure. Also, the inclusion of secondary caregiver will provide a more complete duplication of the original family stress model. Also, by including more perspective of report on some of the measures such as father's report or even teacher's report, we might be able to get a more accurate measure that reflect the actual construct we want to measure. Finally, if the data permits, it will be interesting to test prediction association using more waves of data. And testing whether there is reciprocal prediction effect between adjustment outcomes and parental behaviors would also be of interest.

In conclusion, the two studies integrated the current view of parental control by exploring the antecedents of parental control behaviors and offers new insights of how parental control affects child outcomes in the context of family stress model and through the lens of self-determination needs. Specifically, it appears that marital conflicts might explain some of the psychological control behaviors that parents use, but not so much on explaining behavioral control behavior. Moreover, parental psychological control and behavioral control are two distinct construct. Depending which type of parental control behavior parent focus on, it will lead to less tension on the other kind of control behavior and different child negative outcomes. These

findings confirmed that internalizing behaviors were caused by parental psychological control behavior, while externalizing behaviors were results of parental behavioral control. It also suggested that intervention of marital conflicts may have positive impact on decreasing the use of parental behavioral control but not on behavioral control. In addition, by revisiting the association between parental control behaviors and child developmental outcomes, the current study provides helpful information between the effects of parental control behaviors on child development in an urban sample. By introducing the three basic needs of the children, the results also provide useful insights for a better understanding regarding the complicated mechanism between the associations.

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APPENDIX. IRB EXEMPT STATUS

IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY

Institutional Review Board
Office for Responsible Research
Vice President for Research
1138 Pearson Hall
Ames, Iowa 50011-2207
515 294-4566
FAX 515 294-4267

Date: 10/9/2015

To: Dong Zhang
0074 LeBaron Hall

CC: Dr. Clinton G Gudmunson
2380 Palmer Bldg

From: Office for Responsible Research

Project Title: Association between Family Stresses and Child Problem Behaviors

The Co-Chair of the ISU Institutional Review Board (IRB) has reviewed the project noted above and determined that the project:

- ☐ Does not meet the definition of research according to federal regulations.
- ☒ Is research that does not involve human subjects according to federal regulations.

Accordingly, this project does not need IRB approval and you may proceed at any time. We do, however, urge you to protect the rights of your participants in the same ways you would if IRB approval were required. For example, best practices include informing participants that involvement in the project is voluntary and maintaining confidentiality as appropriate.

If you modify the project, we recommend communicating with the IRB staff to ensure that the modifications do not change this determination such that IRB approval is required.

IRB ID: 15-508

INSTITUTIONAL REVIEW BOARD (IRB)

Exempt Study Review Form

Title of Project: Association between Family Stresses and Child Problem Behaviors		RECEIVED SEP 18 2015 By IRB
Principal Investigator (PI): Dong Zhang		Degrees: M.P.A.
University ID: 539549010	Phone: 5157087129	Email Address: ryanzd@iastate.edu
Correspondence Address: 0074 LeBaron Hall		
Department: HDFS		College/Center/Institute: Human Science
PI Level: <input type="checkbox"/> Tenured, Tenure-Eligible, & NTER Faculty <input type="checkbox"/> Adjunct/Affiliate Faculty <input type="checkbox"/> Collaborator Faculty <input type="checkbox"/> Emeritus Faculty <input type="checkbox"/> Visiting Faculty/Scientist <input type="checkbox"/> Senior Lecturer/Clinician <input type="checkbox"/> Lecturer/Clinician, w/Ph.D. or DVM <input type="checkbox"/> P&S Employee, P37 & above <input type="checkbox"/> Extension to Families/Youth Specialist <input type="checkbox"/> Field Specialist III <input type="checkbox"/> Postdoctoral Associate <input checked="" type="checkbox"/> Graduate/Undergrad Student <input type="checkbox"/> Other (specify:)		
FOR STUDENT PROJECTS (Required when the principal investigator is a student) Name of Major Professor/Supervising Faculty: Clinton Gudmunson University ID: 933256324 Phone: 5152948439 Email Address: cgudmuns@iastate.edu Campus Address: 1323 Palmer Hall Department: HDFS Type of Project: (check all that apply) <input checked="" type="checkbox"/> Thesis/Dissertation <input type="checkbox"/> Class Project <input type="checkbox"/> Other (specify:)		
Alternate Contact Person:		Email Address:
Correspondence Address:		Phone:

ASSURANCE

- I certify that the information provided in this application is complete and accurate and consistent with any proposal(s) submitted to external funding agencies. Misrepresentation of the research described in this or any other IRB application may constitute non-compliance with federal regulations and/or academic misconduct.
- I agree to provide proper surveillance of this project to ensure that the rights and welfare of the human subjects are protected. I will report any problems to the IRB. See Reporting Adverse Events and Unanticipated Problems for details.
- I agree that modifications to the approved project will not take place without prior review and approval by the IRB.
- I agree that the research will not take place without the receipt of permission from any cooperating institutions, when applicable.
- I agree to obtain approval from other appropriate committees as needed for this project, such as the IACUC (if the research includes animals), the IBC (if the research involves biohazards), the Radiation Safety Committee (if the research involves x-rays or other radiation producing devices or procedures), etc.; and to obtain background checks for staff when necessary.
- I understand that IRB approval of this project does not grant access to any facilities, materials, or data on which this research may depend. Such access must be granted by the unit with the relevant custodial authority.
- I agree that all activities will be performed in accordance with all applicable federal, state, local, and Iowa State University policies.

Signature of Principal Investigator _____ Date _____ Signature of Major Professor/Supervising Faculty _____ Date _____
 (Required when the principal investigator is a student)

- I have reviewed this application and determined that departmental requirements are met, the investigator(s) has/have adequate resources to conduct the research, and the research design is scientifically sound and has scientific merit.

Printed Name of Department Chair/Head/Director _____ Signature of Department Chair/Head/Director _____ Date _____

For IRB Use Only	<input type="checkbox"/> Not Research Per Federal Regulations	<input checked="" type="checkbox"/> No Human Participants	Review Date: 10/8/15
	<input type="checkbox"/> Minimal Risk	EXEMPT Per 45 CFR 46.101(b):	

Exempt Study Information

Please provide Yes or No answers, except as specified. Incomplete forms will be returned without review.

Part A: Key Personnel

1. List all members and relevant qualifications of the project personnel and define their roles in the research. Key personnel include the principal investigator, co-principal investigators, supervising faculty member, and any other individuals who will have contact with the participants or the participants' data (e.g., interviewers, transcribers, coders, etc.). This information is intended to inform the committee of the training and background related to the specific procedures that each person will perform on the project. For more information, please see [Human Subjects – Persons Required to Obtain IRB Training](#).

[illegible]

Please complete additional pages of key personnel as necessary.

<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2. Does your study include children (persons under age 18) as research subjects?
<p>If Yes, please read and respond to the following:</p> <p>ISU policy requires that background checks be completed for all researchers and key personnel who will have any contact with children involved in this research project. Details regarding this policy can be found here. Principal Investigators and faculty supervisors are responsible for ensuring that background checks are completed BEFORE researchers or key personnel may have any contact with children. Records documenting completion of the background checks must be kept with other research records (e.g., signed informed consent documents, approved IRB applications, etc.) and may be requested during any audits or Post-Approval Monitoring of your study.</p>	
<input checked="" type="checkbox"/> Agreed	2.a. Please check here to indicate that you have read this information and agree that you will comply with these requirements.

Part B: Funding Information and Conflicts of Interest

<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	1. Is or will the project be externally funded?
If No , skip to question 8.	
<p>If Yes, please identify the type(s) of source(s) from which the project is directly funded.</p> <p> <input type="checkbox"/> Federal agency <input type="checkbox"/> State/local government agency <input type="checkbox"/> University or school <input type="checkbox"/> Foundation <input type="checkbox"/> Other non-profit institution <input type="checkbox"/> For-profit business <input type="checkbox"/> Other; specify: _____ </p>	
<input type="checkbox"/> Yes <input type="checkbox"/> No	2. Is ISU considered to be the Lead or Prime awardee for this project?
<input type="checkbox"/> Yes <input type="checkbox"/> No	3. Are there or will there be any subcontracts issued to others for this project?
<input type="checkbox"/> Yes <input type="checkbox"/> No	4. Is or will this project be funded by a subcontract issued by another entity?
<input type="checkbox"/> Yes <input type="checkbox"/> No	5. If ISU is the recipient of the subcontract, does it involve any federal funding, such as federal flow-through funds?
6. If this project will be externally funded, please provide the complete name(s) of the funding source(s); please do not use acronyms. If any subcontracts will be issued to others, please describe and include a list of all entities.	

<input type="checkbox"/> Attached	7. Please attach a <u>complete and final copy</u> of the entire grant proposal or contract from which the project is or will be funded.
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	8. Do or will any of the investigators or key personnel listed on this application have a conflict of interest management plan in place with the Office of the Vice President for Research & Economic Development?

Part C: General Overview

Please provide a brief summary of the purpose of your study:
In the current study, I will focus on answering these two main questions based on the theoretical framework of family stress model and self-determination theory. To examine the potential effect of financial pressure on parental control behavior and child outcomes, this study will explicitly investigate the associations among economic pressure, parental control behavior and child outcomes using longitudinal data with a sample of families from the Flourishing Family Project (FFP). In addition, this study will examine how parental control behaviors influence child outcomes through meeting or understanding children's needs for autonomy, competence and relatedness based on self-determination theory. By doing so, the current work attempts to examine and help us understand what affect parents' engagement in either parental control behavior or both by introducing parental control behavior into the family stress model and provide better understanding of parental control behavior on child outcomes through the application of meeting children's needs based on self-determination theory.
Please provide a brief summary of your research design:
The current study will use a secondary data, which I get access from BYU through my major professor. No information in the data set can be used to link to the actual person who answered the question. The data set was collected through questionnaires which contains information including data set management variables, such as family id, parent id and children id. In addition, the data also set contains information regarding how family processes impact the social development of young people as they make the transition from grade school, through high school, and into young adulthood, examples of variable include child externalizing behavior, internalizing behavior, parenting style and etc. Structural equation modeling will be the main tool for this study.

Part D: Exemption Categories

<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	1. Are you conducting research on Educational Practices (e.g., instructional techniques, curriculum effectiveness, etc.)? If Yes, please answer questions 1a through 1e. If No, please proceed to question 2.
<input type="checkbox"/> Yes <input type="checkbox"/> No	1.a. Will the research be conducted in an established or commonly accepted educational setting, such as a classroom, school, professional development seminar, etc.?

<input type="checkbox"/> Yes <input type="checkbox"/> No	1.b.	Will the research be conducted in any settings that would not generally be considered to be established or commonly accepted educational settings? If Yes , please specify: _____
<input type="checkbox"/> Yes <input type="checkbox"/> No	1.c.	Will the research procedures and activities involve normal educational practices (e.g., activities that normally occur in the educational setting)? Examples include research on regular or special education instructional strategies or the effectiveness of instructional techniques, curricula, or classroom management methods.
<input type="checkbox"/> Yes <input type="checkbox"/> No	1.d.	Will the research procedures include anything other than normal educational practices? If Yes , please specify: _____
<input type="checkbox"/> Yes <input type="checkbox"/> No	1.e.	Will the procedures include randomization into different treatments or conditions, radically new instructional strategies, or deception of subjects? If Yes , please specify: _____

<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.	Does your research involve use of educational tests, survey procedures, interview procedures, or observations of public behavior? If Yes , please answer questions 2.a. through 2.b. If No , please proceed to question 3.
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	2.a.	Will the research involve one or more of the following? (Check all that apply.) <ul style="list-style-type: none"> <input type="checkbox"/> The use of educational tests (cognitive, diagnostic, aptitude, achievement) <input type="checkbox"/> Surveying or interviewing adults <input type="checkbox"/> Observations of public behavior* of adults <input type="checkbox"/> Observations of public behavior* of children, when the researcher will not interact or intervene with the children <p>*Note: Activities occurring in the workplace and school classrooms are not generally considered to involve public behavior.</p>
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	2.b.	Are all of the participants elected or appointed public officials or candidates for public office?

<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.	Does the research involve the collection or study of currently existing data, documents, records, pathological specimens, or diagnostic specimens? If Yes , please answer questions 3.a. through 3.b. If No , please proceed to question 4.
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	3.a.	Are all of the data, documents, records, or specimens publicly available?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.b.	Will the data you record for your study include ID codes? If Yes , please answer 3.b.(1) and 3.b.(2).

The ID codes do not identify individuals - per summary on p. 4. (RS)

☐ Yes ☒ No 3.b.(1). Does a "key" exist linking the ID codes to the identities of the individuals to whom the data pertains?

☐ Yes ☒ No 3.b.(2). Will any persons on the research team have access to this key?

☐ Yes ☒ No 4. Does your research involve Taste and Food Quality tests and Consumer Acceptance Studies involving food? If Yes, please answer questions 4.a. through 4.c. If No, please proceed to question 5.

☐ Yes ☐ No 4.a. Is the food to be consumed normally considered wholesome, such as one would find in a typical grocery store?

☐ Yes ☐ No 4.b. If the food contains additives, are the additives at or below the level normally considered to be safe by the FDA, EPA, or Food Safety and Inspection Service of USDA? Consider additives in commercially available foods found at a grocery store and/or any additives that are added to food for research purposes.

☐ Yes ☐ No 4.c. If there are agricultural chemicals or environmental contaminants in the food, are they at or below the level found to be safe by the FDA, EPA, or Food Safety and Inspection Service of USDA?

☐ Yes ☒ No 5. Is your study a research or demonstration project to examine

- Federal public benefit or service programs such as Medicaid, unemployment, social security, etc.; or
- Procedures for obtaining benefits or service under these programs; or
- Possible changes in or alternatives to those programs or procedures; or
- Possible changes in methods or levels of payment for benefits or services under these programs?

☐ Yes ☐ No 5.a. If Yes, is the research or demonstration project pursuant to specific federal statutory authority?

Part E: Additional Information

☐ Yes ☒ No 6. Does your research involve any procedures that do not fit into one or more of the categories in items #1–#5 listed above, such as the following? (Check all that apply.)

- ☐ Usability testing of websites, software, devices, etc.
- ☐ Collection of information from private records when identifiers are recorded
- ☐ Procedures conducted to induce stress, moods, or other psychological or physiological reactions
- ☐ Presentation of materials typically considered to be offensive, threatening, or

- degrading
- ☐ Video recording or photographing non-public behaviors
- ☐ Use of deception (e.g., misleading participants about the procedures or purpose of the study)
- ☐ Physical interventions, such as
- ☐ blood draws
 - ☐ new collection of biological specimens
 - ☐ use of physical sensors (ECG, EKG, EEG, ultrasound, etc.)
 - ☐ exercise, muscular strength assessment, flexibility testing
 - ☐ body composition assessment
 - ☐ measuring of height and weight
 - ☐ x-rays
 - ☐ changes in diet or exercise
- ☐ Tests of sensory acuity (i.e., vision or hearing tests, olfactory tests, etc.)
- ☐ Consumption of food (other than as described in #4) or dietary supplements
- ☐ Clinical studies of drugs or medical devices
- ☐ Other; please specify: _____

☐ Yes ☐ No 6.a. If Yes, is your research conducted in an established educational setting, and are the checked procedures part of normal educational practices given that setting? If Yes, please describe:

☒ Yes ☐ No 7. Do you intend or is it likely that your study will include any persons from the following populations? (Check all that apply.)

- ☐ Prisoners
- ☐ Cognitively impaired
- ☒ Children (persons under age 18)
- ☐ Wards of the State
- ☐ Persons who are institutionalized

7.a. If Yes, please describe how they will be involved and what procedures they will complete:

Second hand data from survey questionnaire

☐ Yes ☒ No 8. Will any of the following identifiers be *linked to the data* at any time point during the research? (Check all that apply.)

- ☐ Names: ☐ First Name Only ☐ Last Name Only ☐ First and Last Name
- ☐ Phone/fax numbers
- ☐ ID codes that can be linked to the identity of the participant (e.g., student IDs, medical record numbers, account numbers, study-specific codes, etc.)
- ☐ Addresses (email or physical)
- ☐ Social security numbers
- ☐ Exact dates of birth
- ☐ IP addresses
- ☐ Photographs or video recordings
- ☐ Other; please specify: _____

☐ Yes ☒ No 9. Is there a reasonable possibility that participants' identities could be ascertained from any combination of information in the data? If Yes, please describe: _____

<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	10. Will participants' identities be kept confidential when results of the research are disseminated?
<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	11. Could any of the information collected, if disclosed outside of the research, reasonably place the subjects at risk of any of the following? (Check all that apply.)
		<input type="checkbox"/> Criminal liability <input type="checkbox"/> Civil liability <input type="checkbox"/> Damage to the subjects' financial standing <input type="checkbox"/> Damage to the subjects' employability <input type="checkbox"/> Damage to the subjects' reputation
<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	12. Does the research, directly or indirectly, involve or result in the collection of any information regarding any of the following? (Check all that apply.)
		<input type="checkbox"/> Use of illicit drugs <input type="checkbox"/> Criminal activity <input type="checkbox"/> Child, spousal, or familiar abuse <input type="checkbox"/> Mental illness <input type="checkbox"/> Episodes of clinical depression <input type="checkbox"/> Suicidal thoughts or suicide attempts <input type="checkbox"/> Health history <input type="checkbox"/> History of job losses <input checked="" type="checkbox"/> Exact household income other than in general ranges <input type="checkbox"/> Negative opinions about one's supervisor, workplace, teacher, or others to whom the subject is in a subordinate position <input type="checkbox"/> Opinions about race, gender, sexual orientation, or any other socially sensitive or controversial topics <input type="checkbox"/> Sexual preferences or behaviors <input checked="" type="checkbox"/> Religious beliefs <input type="checkbox"/> Any other information that is generally considered to be private or sensitive given the setting of your research; if so, please specify: _____

After completion of Parts A, B, and C of this application, please send the completed form to:

Institutional Review Board (IRB)
 Office for Responsible Research
 1138 Pearson Hall
 Ames, IA 50011-2200

Data collection materials (e.g., survey instruments, interview questions, recruitment and consent documents, etc.) do not need to be submitted with this application.

If you have any questions or feedback, please contact the IRB office at IRB@iastate.edu or 515-294-4566.